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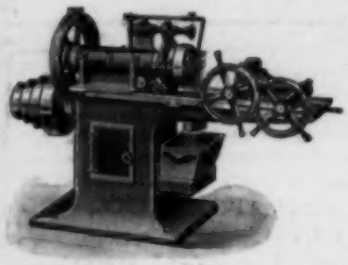
THE IRON TRADE REVIEW

A Weekly Journal Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

VOLUME XXXVII | CLEVELAND, OHIO, MARCH 10, 1904 | NUMBER 10



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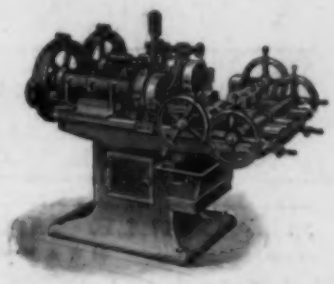

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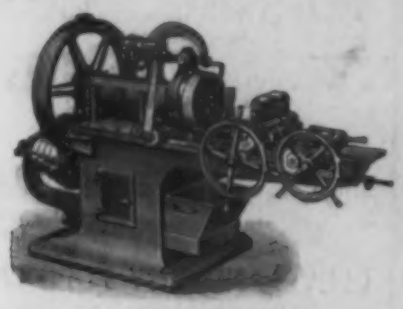

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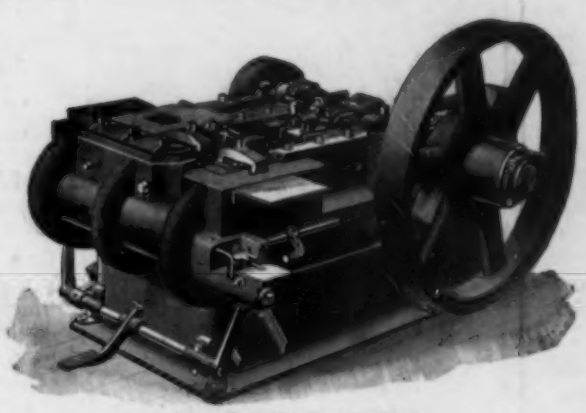

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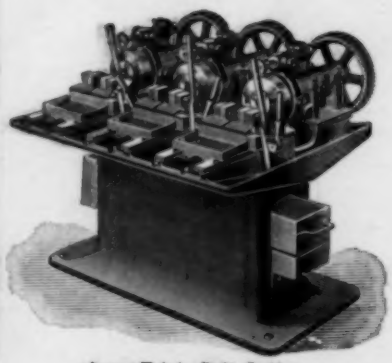

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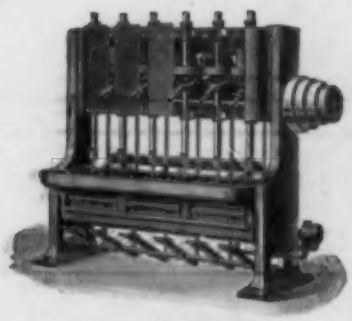

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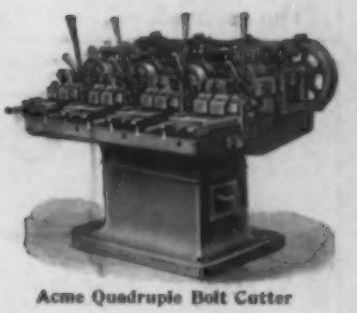

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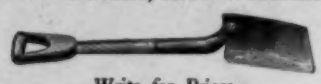

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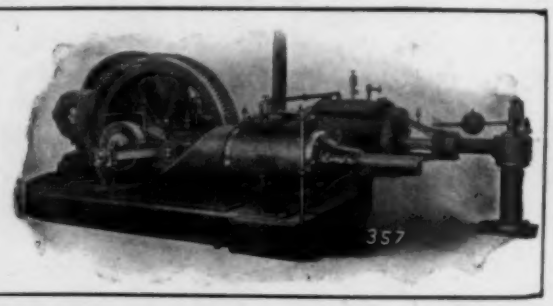

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THE IRON TRADE REVIEW

VOLUME XXXVII CLEVELAND, OHIO, MARCH 10, 1904 NUMBER 10

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The week has been one of decided activity in the iron trade and with the improvement in demand has come some advance in prices, this being most marked in Southern pig iron. Whether because of the Steel Corporation's purchases, or because of other signs of a supposed turning point, a number of important consumers of forge and foundry iron have been on the market, and large transactions have resulted. Some of this business was done at $9 at furnace for Southern No. 2, but $9.25 is now the common minimum of Southern sellers, while within a day or two $9.50 has returned as the firm quotation of some furnaces. The week's business for one Southern company was 55,000 tons and another was not far behind. The heavy pig iron buying and the developments of the week in certain finished products have begotten a much more hopeful feeling throughout the trade, which the coming of the season for building operations has done much to increase.

The Steel Corporation's Bessemer pig iron purchases and options are closely estimated at 170,000 tons, of which about 90,000 tons is iron actually taken. Outside buying of Bessemer and the week's business in forge iron bring the total up to 200,000 tons. The options are to be exercised on the 10th of March and April. Pittsburg district pipe works have been in the market for gray forge iron, about 15,000 tons being taken by two interests. A cast iron pipe foundry has been a buyer of forge and other irons to the extent of 15,000 tons and a pig iron merchant interest has bought 12,000 tons of foundry grades. A number of consumers of foundry iron in the Chicago district and the Central West have been in the market in the week, and the buying movement has been broad and well sustained. While $7.75 at Southern furnaces has been touched on gray forge, $8 is now the minimum, and in the Pittsburg district Northern forge has advanced to $13, while Central Western furnaces that have shaded $12 at furnace for No. 2 foundry in recent weeks are now on a $12.50 basis.

The March 1 report from blast furnaces using Lake Superior ores reflects the steady increase in production in February. There were 113 furnaces in and 50 out on March 1, while of 166 reporting on Feb. 1, 99 were active and 67 were idle. The Steel Corporation had four-fifths of its furnace capacity active on March 1 as against two-thirds on Feb. 1. Its leading subsidiary company has reduced its pig iron stocks to practically nothing and deliveries on the recent purchases of iron are being urged forward.

The Pittsburg district seconds the more active condition in pig iron with a cheerful report concerning finished material, though heavy products are still much behind the lighter forms. Specifications are coming in with much more freedom and mills are running on fuller schedules. In the Pittsburg district 10,000 tons of structural material will be needed for railroad work soon to be begun, but there is little definite development elsewhere in building projects that have been regarded as promising. The plate market is still far from satisfactory and rails are at a standstill.

The bar, wire and pipe trades continue to furnish encouragement. Bar iron has advanced $1 a ton, in some markets $2, and an early advance in steel bars is regarded as at least probable.

Tin plates have shown new life in the past few weeks and canning interests have made partial requisitions. Prices have gone to a point that is forcing wages down and an important conference is in session at Pittsburg as this is written, the leading manufacturer having proposed a further 10 percent reduction.

The Lake Superior iron ore interests after a further meeting in New York on Monday, which reached no agreement, adjourned to April 1. Three weeks' developments in the iron market are expected to help to a final decision.

PITTSBURG.

(By Telegraph.)

PITTSBURG, Pa., March 9.—The Standard Sanitary Mfg. Co. today closed for the purchase of about 8,000 tons of foundry and forge iron for delivery during the months of April, May and June at its Louisville, Ky., New Brighton and Allegheny, Pa., plants. About 3,500 tons of forge and foundry was purchased for the Louisville plant, and was placed at $9, Birmingham, for the No. 2, and $8, Birmingham, for the forge. Foundry iron for the Pennsylvania plants was purchased from Northern and Southern furnaces at prices ranging from $13.35 to $13.75 for No. 2 delivered. We also note the sale of 1,000 tons of No. 2 foundry for delivery during the months of May and June at $13.75, Pittsburg. This transaction involves a particularly desirable iron. The 8,000-ton purchase is a part of the 20,000 tons spoken of in the report below, for which specifications were out.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, March 9.

Bessemer iron purchases made and options secured by the United States Steel Corporation for delivery during the months of March, April and May, aggregate about 170,000 tons and purchases of Bessemer and forge by outside interests bring the total up to about 200,000 tons. In addition inquiries are out for bids on 20,000 tons of forge and foundry iron for delivery during the next three months which will probably be closed within the next few days. Practically all the available Bessemer in the Mahoning and Shenango Valleys for delivery this month has been purchased, while for April and May delivery the tonnage not now spoken for, that can be delivered by the furnaces is very small. The option on iron for March delivery taken by the United States Steel Corporation expires on Thursday, while additional options expire on April 10 and May 10. In addition the corporation reserves the right to cancel deliveries on each of these dates on all iron remaining undelivered on the previous month's specifications. Among the Bessemer iron purchases made was 20,000 tons from Cleveland furnaces for delivery to the steel plant of the American Steel & Wire Co. at that place. All of the corporation transactions are on the basis of $13 Valley furnace, but furnaces having iron for April and May delivery will not quote below $14, Pittsburg. It is understood that the corporation's actual purchases of Bessemer iron have been about 90,000 tons and that close to 80,000 tons is under option.

Purchases of forge iron were made by the National

Tube Co., Lockhart Iron & Steel Co., and several smaller iron mills in this district aggregating about 10,000 tons, while a total of 3,000 tons of foundry iron has also been taken. About 7,000 tons of the forge iron went to Southern foundry now range from $13.35 to $13.85, Pittsburg, while 3,000 tons went to Northern producers at $12.75 and a shade higher, Pittsburg. Bids are now being called for on 13,000 tons of forge and 7,000 tons of foundry iron and the orders will be placed before the end of the week. As a result of these purchases Northern producers of forge iron are quoting $13, Pittsburg, while quotations on Northern foundry now range from $13.35 to $13.85, PitYtsburg. Not in years have the stocks of steel-making iron been as low at Carnegie Steel Co. furnaces as during the past week, and everything is being done to push deliveries from Valley furnaces this month.

The blast furnace statistics compiled by J. G. Butler, Jr., of Youngstown, O., on the operation of furnaces using Lake Superior ores show 113 in blast March 1, out of 163 reporting.

On that date the United States Steel Corporation had 79 percent of its capacity in operation, an increase of 12 percent during February. The active capacity of the Bessemer Pig Iron Association furnaces also increased from 31.9 to 58 percent, and while the Republic Iron & Steel Co. showed no change, two of its idle stacks are to be blown in shortly.

Meetings of steel producers will be held in New York in April. The billet, plate, structural and rail associations will hold their quarterly meetings, and from present indications prices will be held as they are.

A meeting of the ore producers was held in New York on Monday, but no action was taken towards fixing this year's ore prices. Another meeting will be held on April 1, probably in Pittsburg, but it is considered doubtful if any agreement will be reached.

In certain finished lines the market continues to grow stronger, though plates, structural material and rails show no great activity. Heavy orders for steel bars have been placed during the week by agricultural implement manufacturers for delivery in the remainder of the year, and large additional tonnage will be booked this week, as it is proposed that at the meeting of the steel bar association to be held next week an advance of $1 per ton be made. Iron bars are held firmly at 1.35c, Pittsburg, by the largest producers, being an advance of $1 per ton over last week's prices. The American Steel & Wire Co. on Monday announced its long anticipated advance of $1 per ton on nails and wire products. For several weeks, however, the large jobbers have been quoting this advance, as have two of the largest independent manufacturers. The demand for merchant pipe is greater than it was at this time last year and there is every indication now that this year will be a record breaker. The tin plate trade is also improving, the largest producer having booked some heavy orders during the week for the canning season. The outlook for the spring trade in tin plate is unusually bright.

Owing to the scarcity of cars prompt furnace and foundry coke is commanding premiums, as high as $1.75 being offered for furnace for delivery in March by Valley furnaces and $2.25 and $2.50 is being paid for foundry coke on which the delivery is assured.

Pig Iron.—The Republic Iron & Steel Co. will blow in its Haselton and Atlantic stacks, located at Haselton, O., and New Castle, Pa., within a few days. The Brier Hill Coal & Iron Co. this week blew in its stack at Youngstown, O., and several other Valley stacks are preparing to resume operations. In the month of February 14 idle furnaces in the territory using Lake Superior ores resumed operations. Out of a total of 163 furnaces that sent reports of their operations to J. G. Butler, Jr., of Youngstown, O., 113 were in operation on March 1 as compared with 99 on Feb. 1, and 50 were idle. Out of 166 furnaces reporting on Feb. 1, 67 were out and 99 in or 61.6 percent in and 38.4 percent out. On March 1 the active percentage had increased to 72 and the idle percentage decreased to 28. The operation of these stacks on March 1 was as follows:

Company.	Daily Cap. Gr. Tons.	Cap. In. Gr. Tons.	Cap. Out. Gr. Tons.	P. ct In.	P. ct Out
U. S. Steel Corporation	25,887	20,437	5,450	79	21
Bessemer Pig Iron Assn.	3,779	2,200	1,579	58	42
Repub. Iron & Steel Co.	925	425	500	46	54
Pennsylvania and Maryland Steel and others	15,226	9,895	5,331	65	35
	45,817	32,957	12,860	72	28

In February the United States Steel Corporation increased its active capacity from 67 to 79 percent and the Bessemer Pig Iron Association from 31.9 to 58 percent. The Republic Iron & Steel Co. made no change whatever in its active and idle capacity while the Pennsylvania and Maryland Steel Companies and other concerns increased their active stacks from 62.5 to 65. Mr. Butler also received reports from five furnaces that expect to resume in March, from five that will resume in April, while two expect to blow out in April, one in March, and two stacks that are incomplete will be ready to blow in on Aug. 1! Twenty-six furnaces are indefinite as to resumption. The daily capacity of the furnaces reporting shows a large increase over the capacity given on Feb. 1, as the figures on that date were based on the actual output of the furnaces last September when many of them were running slow. We make the following quotations:

Bessemer, Valley	$13 00 to 13 15
Bessemer, Pittsburg	13 85 to 14 00
No. 1 Foundry	13 85 to 14 10
No. 2 Foundry	13 35 to 13 85
Gray forge, Pittsburg	13 00
Chilled basic, Valley	12 75 to 13 00
Chilled basic, Pittsburg	13 60 to 13 85

Steel.—The tonnage of Bessemer and open-hearth billets, sheet and tin bars offered for March delivery is much smaller than for some time, and with more finishing mills in operation and numerous idle steel plants there is less incentive on the part of the steel mills to offer concessions. The association prices are being more rigidly adhered to than for some time, although sales are not very heavy. We quote agreement prices as follows: Bessemer and open-hearth billets, 4 x 4 inches, and slabs, up to and including 0.25 carbon, $23, Pittsburg, Wheeling, Valley, Johnstown, Ashland, Ky., Ironton, O., and Lorain, O., 0.26 and including 0.60 carbon, $1 advance; and 0.61 to 1.00 carbon, $2 advance. Billets smaller than 3⅞ inches and sheet and tin bars are $1 per ton extra. Bessemer and open-hearth rods are still quoted at $30, Pittsburg.

Ferro-Manganese.—We note the sale of 5,000 tons of foreign and domestic ferro for delivery the remainder of the year at prices ranging from $41.50 to $42, Pittsburg. On smaller lots, however, $43 is quoted, delivered at buyers's mill at any point east of the Mississippi river.

Spelter.—Prime Western grades are held at 4.90c to 4.95c, delivered Pittsburg in carload lots.

Muck Bar.—The market is quiet, but with the stiffening of the forge iron market neutral muck is firm at $26, Pittsburg.

Skelp.—Demand for both iron and steel skelp is strong, due to the activity of the pipe mills. Grooved iron skelp is held at 1.50c to 1.55c and sheared at 1.55c to 1.60c. Steel skelp is held at 1.35c to 1.45c for both grooved and sheared.

Rails and Track Material.—The light rail market is weak and there is little buying. New tonnage in standard sections placed during the week has not been heavy. We make the following quotations: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; 16 to 40 pounds, $23 to $24. Track material: Spikes, 1.65c to 1.70c.

Plates.—Demand for plates is practically unchanged and little new business is being offered, while specifications on old contracts are light. We quote: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates more than 100 inches, 5c extra 100 pounds. Plates 3-16 inch in thickness, $2 extra; gauges Nos 7 and 8, $3 extra. These quotations are based

on carload lots, with 5c extra a hundred pound for less than carload lots. Terms, net cash, in 30 days.

Bars.—The largest producers of iron bars are now quoting uniformly on a basis of 1.35c, Pittsburg, which is an advance of $1 over last week's prices. The buying of steel bars is heavy in anticipation of an advance which will no doubt follow the meeting of steel bar manufacturers to be held next week. Hoops and bands continue to be shaded, the former being sold at 1.35c and bands being held at 1.25c, base. No price has yet been fixed on cotton ties, although efforts are being made to reach an agreement. We make the following quotations: Bessemer steel bars, 1.30c; open-hearth, 1.40c; plow beams and cultivator beams, 1.30c, net; channels, angles, zees and tees Bessemer, under 3 inches, 1.40c; common bar iron, 1.35c, Pittsburg. The following differentials are maintained on steel: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance.

Structural Material.—With the passage of the Wabash and Pennsylvania R. R. Duquesne Way ordinances and the B. & O. station ordinance a large tonnage of structural material is assured the mills of this district during the next six months. It is estimated that 10,000 tons of material will be required for this work. Demand is improving and a fair spring demand is promised. We make the following quotations: Beams and channels, 3 to 15 inches, are quoted, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles, from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

Sheets.—Demand for sheets is improving slightly, but official quotations are being shaded by some of the independent mills. We quote black sheets, one pass, as follows: No. 8, 1.80c to 1.85c; No. 9, 1.85c to 1.90c; Nos. 12-14, —c; Nos. 15-17, 2c; Nos. 18-21, 2.05c; Nos. 22-24, 2.10c; Nos. 25-26, 2.15c; No. 27, 2.20c; No. 28, 2.30c; No. 29, 2.60c; No. 30, 2.70c. Galvanized: Nos. 12-17, 2.40c; Nos. 18-21, 2.55c; Nos. 22-24, 2.70c; Nos. 25-26, 2.90c; No. 27, 3.10c; No. 28, 3.30c; No. 29, 3.70c; No. 30, 4.10c.

Tin Plate.—Some large orders for tin plate have been placed during the week by large canning interests and the outlook for a heavy spring demand is bright. We quote 100-pound coke plates at $3.45 f. o. b. nearest mill, Pittsburg district.

Pipes and Tubes.—Demand for merchant pipe is increasing and if the demand continues as heavy as during the past two months this year will break all previous records in the pipe trade. Discounts to consumers, carload lots f. o. b. Pittsburg, plus freight to destination according to Tube Rate Book, are as follows:

MERCHANT PIPE.

	Steel		Iron.	
	Black.	Galv.	Black.	Galv.
⅛, ¼, ⅜ inch	68	58	66	56
½ inch	71	61	69	59
¾ to 6 inch	75	65	73	63
7 to 12 inch	71	61	68	58
Ex. Stg., plain ends, ⅛ to 8 in.	67	57	64	54
Double Ex. Stg., pl. ends, ⅛ to 8 in.	59	49	56	46

BOILER TUBES.

	Steel.	Iron
1 to 1½ inch	42½	39
1¾ to 2¼ inch	55½	38
2½ inch	58	43
2¾ to 5 inch	64½	50½
6 to 13 inch	55½	38

Wire and Wire Nails.—The American Steel & Wire Co. this week announced an advance of $1 per ton on wire nails and wire products effective on March 7. For several weeks the higher price has been asked by all the large jobbers and several of the largest independent producers however. We make the following quotations: Wire nails, carload lots, to jobbers, f. o. b. cars Pittsburg, $1.90 base, plain wire, carload lots, $1.80 base; barb wire, carload lots, $2.20, base; staples, carload lots, $2.05, keg. Galvanized, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel and iron cut nails, carload lots, $1.70, and less than carload lots, $1.75, f. o. b., Pittsburg, plus freight to point of destination. Terms, 60 days less 2 percent off in 10 days.

Merchant Steel.—Demand for the finer grades of steel is improving and the crucible steel mills have greatly increased their output during the past few weeks. Demand for shafting is also showing a slight improvement. We make the following quotations: Cold rolled and ground shafting 52 off in carload lots and 47 percent off in less than carload lots. Tire steel, 1.50c, base; spring steel, 1.90c to 2c; toe calk, 1.85c, base. Tool steel is quoted 6 cents and upwards, according to the grade.

Old Material.—The old material market is quiet at the present time, most of the steel mills having covered for their immediate requirements of heavy melting stock, while the steel casting plants and iron foundries are not buying low phosphorus stock or cast scrap. On low phosphorus, below .03 a large lot has been offered in this market during the week at $14, gross ton. We make the following quotations gross tons: Heavy melting scrap, $13.50 to $14; low phosphorus scrap, $14 to $14.50; old steel rails, $13.50 to $14; sheet scrap, $8 to $8.50; No. 1 wrought, $13.50; cast borings, $5.25 to $5.50; wrought iron turnings, $9.50 to $10.

Coke.—A scarcity of cars still prevents the proper movement of coke and as a result prompt foundry and furnace coke has advanced from 15 to 25 cents a ton. As high as $1.75 has been paid for Connellsville coke for shipment the remainder of this month, while prompt foundry is selling at prices ranging from $2.25 to $2.50. For the week ending Saturday Feb. 27 the production of the upper Connellsville region amounted to 171,549 tons and that of the lower region to 48,940 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, March 8

This market shows increasing firmness in nearly all lines. A conspicuous exception is plates. Pig iron is 25c a ton stronger than a week ago; bar iron has advanced $2 a ton, and wire products, including nails, barbed wire, smooth wire and staples, are also $1 a ton higher. The leading producer of steel hoops has declined to meet outside competition in this product, having set its minimum price at 1.46½c Chicago. Speculation is again rife as to the possibility of an early advance in steel bars, reports from the East being again to the effect that some producers are considering such a step. The situation in plates is not encouraging, independent mills shading official prices 50c a ton in this market to stimulate buying, with the plate mill at South Chicago still idle for lack of specifications. Boiler tubes are also quiet, and while no change in prices has been made, the smaller consumers are being quoted the discounts which heretofore have been offered only to jobbers and large consumers. Demand for both black and galvanized sheets is of good volume, though some mills are still cutting the usual prices. The activity in rails and track supplies has subsided considerably, following the heavy business of two weeks ago. Railroads and car builders are buying quite freely of plates, structural steel and iron bars however for car construction purposes, the improved demand from these sources being one of the most encouraging features of the local situation. This in conjunction with the activity of the agricultural trade, forms the basis of most of the optimism which prevails among iron and steel sellers in this market. In axle billets 1,500 tons were bought by a local company, in addition to 5,000 tons recently bought, and there have been a number of other good transactions in steel during the week, with inquiries for 1,500 tons pending.

Coke is firm and deliveries backward owing to the scarcity of cars at the ovens, and good 72-hour Connellsville is quoted at $4.65 to $4.90 Chicago. Our views as to the scrap market reported last week are not shared by a number of dealers, who state that the market is generally 50c to 75c a ton higher than quoted at that time. We have revised our prices.

Pig Iron.—Transactions in the past week have been both numerous and heavy, and have involved some very large tonnages. As a result, prices have stiffened and are today 25c or more above those of a week ago. Nine-dollar iron

is no longer being offered in this market by Southern furnaces, the minimum price for No. 2 foundry now being $9.25 Birmingham, with some producers asking $9.50. Northern furnaces are also quoting $13.50 Chicago for No. 2, and the market is strong at this figure. Lake Superior charcoal has advanced from the low prices at which it was selling two weeks ago, and is now quoted from $15 to $15.50 Chicago. The price on malleable iron has also advanced from $13.50, at which a round lot was recently sold in this district, to $13.75 and $14 on smaller lots within the past week.

With spring already making its appearance felt in the disappearance of the snow and ice, an improvement has been noted in the demand for castings. Foundries generally were found to have little iron in their yards or coming to them, the bulk of the Western trade having covered only for the first three months of the year and for such iron as they actually expected to consume in this period. Practically all of these contracts will expire in March, and when Southern iron touched $12.85 Chicago and Northern No. 2 $13 Chicago, there was a brisk movement to cover. Last week this wave of orders reached its flood, among the buyers being a large local jobbing interest which purchased 5,000 tons of No. 2 at $9 Birmingham from one Southern producer, and 8,500 tons of the same grade at $9.25 from another maker. The sales of last week also included 7,500 tons to a pipe concern, and several lots ranging from 1,000 to 5,000 tons each, which were closed at prices varying from $9 to $9.25 Birmingham for No. 2 foundry, including 1,200 tons from the Pullman Co. and 1,200 tons from the American School Furniture Co., both of which orders, it is stated, were taken at $9 Birmingham. The tonnage which changed hands last week may be better estimated by the statement of one Southern producer that its orders aggregated 20,000 tons of all grades, and the report of another producer, that its various representatives in two days last week, closed contracts for 35,000 tons. Practically all of this iron was sold for delivery in April, May and June, few furnaces considering orders for shipment after that period. Some interests have withdrawn from the market, pending a further advance in prices, and owing to the firm attitude of other makers a large tonnage has been held up, which otherwise would have been placed. We have revised our quotations, and for Chicago delivery, carload lots, quote as follows:

Lake Superior Charcoal	$15 00 to 15 50
Northern Coke Foundry No. 1	13 75 to 14 25
Northern Coke Foundry No. 2	13 25 to 13 50
Northern Coke Foundry No. 3	12 75 to 13 00
Northern Scotch Foundry No. 1	14 25 to 14 50
Ohio Strong Softeners No. 1	15 30 to 15 80
Ohio Strong Softeners No. 2	14 80 to 15 30
Southern Coke Foundry No. 1	13 60 to 13 85
Southern Coke Foundry No. 2	13 10 to 13 35
Southern Coke Foundry No. 3	12 60 to 12 85
Southern Coke Foundry No. 4	12 35 to 12 60
Southern No. 1 Soft	13 60 to 13 85
Southern No. 2 Soft	13 10 to 13 35
Southern Gray Forge	12 10 to 12 35
Southern Mottled	12 10 to 12 35
Southern Silveries (4% to 6% Silicon)	14 85 to 15 35
Jackson Co. Silveries (8% to 10% Silicon)	18 30 to 18 80
Jackson Co. Silveries (8% to 10% Silicon)	17 80 to 18 30
Alabama and Georgia Car Wheel	19 85
Malleable Bessemer	13 75 to 14 00
Basic Iron	13 60 to 13 85

Iron and Steel Bars.—The leading Western producer of bar iron has advanced its prices to the basis of 1.50c Chicago, and 1.35c Pittsburg. This step has been taken because of the heavy demand from all sources for bar iron and the desire of many consumers to contract for deliveries far ahead into the year. There is also further talk of an advance in steel bars, though these reports lack authoritative confirmation or origin. The transactions in both iron and steel during the week have been voluminous and of very optimistic proportions, the agricultural trade and railroads continuing to buy very freely. Steel hoops are in better condition, the leading producer of this material having established 1.46½c Chicago as its minimum price. Other manufacturers, however, are still quoting 1.25c Pittsburg. We quote mill shipments, Chicago delivery, carload lots, as follows: Bar iron, 1.50c, half extras; soft steel bars, 1.46½c, half extras with 5c to 10c per 100 pounds extra for less than carload lots, with the regular extras for less than a ton of a size; angles, less than 3 x 3, 1.56½c base full extras; hoops, 1.41½c to 1.46½c, full extras. On lots from store, we quote iron bars, 1.60c to 1.70c base, full extras; steel, 1.60c to 1.75c, half extras; small angles, channels and tees, less than 3 x 3, 1.70c to 1.85c, rates, half extras; hoops, 1.75c to 2c.

Billets.—The local car company which recently purchased 5,000 tons of billets for axles, has lately increased its order to 6,500 tons. There have been a number of other good sized purchases in this market during the past week, aggregating several thousand tons, with inquiries pending for 1,000 tons of rerolling billets, 500 tons of sheet bars and 400 tons of wire rods. Official prices are being maintained, and we quote Bessemer and open hearth billets for rerolling or forging work, up to .25 carbon, $24; up to and including .60 carbon, $1 extra; over .60 carbon, $2 extra. Billets for working into axles, $25 Chicago. Open hearth billets in small lots from store, 1.30c per 100 lb.

Sheets.—Buying is of good proportions, and notwithstanding cutting, most producers are maintaining prices and booking a fair business. With the opening of spring weather, there has been an improved demand from concerns engaged in the building trades. Specifications are of good volume and mills are reported comfortably filled with orders. We quote No. 27 black, 2.31½c to 2.36½c; No. 28, 2.36½c to 2.41½c. Galvanized No. 27, 3.26½c to 3.31½c; No. 28, 3.36½c to 3.41½c. On small lots from store, we quote as follows: Nos. 8 and 10, 2.15c to 2.20c; No. 12, 2.20c to 2.25c; No. 14, 2.30c to 2.35c; No. 16, 2.40c to 2.45c; Nos. 18 and 20, 2.50c to 2.55c; Nos. 22 and 24, 2.55c to 2.60c; No. 26, 2.65c to 2.70c; No. 27, 2.75c to 2.80c; No. 28, 2.80c to 2.85c; No. 29, 2.95c to 3c; No. 30, 3.10c to 3.25c. Galvanized, 75 and 7½ percent.

Structural Steel.—The principal buyers in the past week were railroads, who sent in a number of small orders for car material. None of the building contracts mentioned heretofore have as yet been let. Jobbers and fabricators report a fair trade in small lots. Prices are unchanged, and we quote carload lots, mill shipments, Chicago delivery, as follows: Beams and channels, 16 inches and under, 1.76½c; 18 inches and over, 1.86½c universal plates, 1.76½c; angles, 3 x 3 and larger, 1.81½c; zees, 1.76½c. On lots from store, we quote beams, channels and angles, 3 x 3 and larger, 1.90c; 18, 20 and 24-inch, 10c extra; tees, 1.95c rates.

Plates.—The local mill which has been shut down for the past two weeks on account of the scarcity of specifications, is still idle. Prices are being shaded 50 cents a ton by certain independent mills in the East to facilitate the closing of a few orders of fair proportions which are pending, including one of 1,000 tons. We quote prices on carload lots, mill shipments, Chicago delivery, as follows: Tank steel ¼ inch and heavier, 1.76½c; flange steel, 1.86½c. From warehouse, we quote small lots: Tank steel, ¼ inch and heavier, 1.90c to 2c; 3-16, 2c to 2.10c; No. 8, 2.10c to 2.20c; No. 10, 2.15c to 2.25c; flange steel, 2.25c, all f. o. b. warehouse.

Rails and Track Supplies.—While specifications continue up to past proportions, new business in both heavy rails and track supplies is light. No change in prices is reported, and we quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots, $32; second quality, rails, $27; 25-pound rails, $25 to $26; 12-pound rails, $26 to $28, with regular differentials for intermediate sizes. The following quotations on track supplies, which are f. o. b. Joliet mill, may be shaded on large orders: Angle bars, 1.40c to 1.50c; spikes, first quality, 1.70c to 1.80c (out of store, 1.90c rates); track bolts 3½ x ¾, with square nuts, 2.40c to 2.50c per 100 pounds; with hexagon nuts, 2.55c to 2.65c, with usual differentials for other sizes.

Merchant Steel.—New business is of satisfactory volume and specifications on old contracts are also good. Prices are without change and we quote carload lots, mill shipments, Chicago delivery: Spring steel, 2c; sleigh shoe, flat sizes, 1.60c; concave and convex, 1.75c; cutter shoe,

2.25c to 2.30c; smooth finished machinery steel, 1.71½c base; plow steel, 2.30c and upwards, according to quality; toe calk, 2.01½c to 2.11½c. Ordinary grades of tool steel, 6c to 8c; specials, 12c and upwards. Cold rolled shafting, in carload lots, 52, and in less than carload lots, 47 percent discount from list.

Merchant Pipe.—The leading interest as well as other producers and the jobbers report a very brisk demand, the orders including all sizes of pipe and for all classes of work. Mills are well sold ahead and specifications are coming in freely and regularly. Prices are unchanged, and we quote carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

	Steel Pipe. Black. Percent.	Galv. Percent.	Guar. Wrought Iron. Black. Percent.	Galv. Percent.
⅛ to ⅜ inch	67.35	57.35	64.35	54.35
½ inch	70.35	60.35	67.35	57.35
¾ to 6 inches	74.35	64.35	71.35	61.35
7 to 12 inches	69.35	59.35	66.35	56.35

Less than carloads, 12½ per cent. advance.

Boiler Tubes.—A falling off in demand for boiler tubes has been noticed for some weeks and prices have been shaky. To stimulate the buying, the leading producer, while making no change in its prices, is quoting to the smaller consumers the same discounts which heretofore have been quoted only to jobbers and the larger consumers. We have accordingly revised our prices, and quote carload lots, f. o. b. Chicago, as follows:

	L. W. Steel. Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ inch	43.35	40.85	53.35
1¾ to 2¼ inch	55.85	38.35	40.35
2½ inch	58.35	43.35	....
2¾ inch to 5 inch	64.35	50.85	Up to 4 inches.
6 to 13 inch	55.85	38.35	48.35

For car lots or less, direct from warehouse stock:

	L. W. Steel. Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ inch	40	35	37.50
1¾ to 2½ inch	50	32.50	35
2¾ to 5 inch	60	45	Up to 4 inches.
6 to 13 inch	50	32.50	45

Cast Iron Pipe.—A marked impovement is noted from all sections of the country, the aggregate tonnage of the past week, while not including any big lots, being of good proportions. There are no changes in prices, and we quote carload lots, Chicago delivery: 4-inch water pipe, $26.50; 6-inch to 12-inch, $25.50; larger sizes, $24.50; gas pipe, $1 a ton higher. These prices may be shaded on larger orders.

Wire Products.—The leading interest reports that it has advanced its prices on wire nails, barbed wire, smooth wire and staples, $1 a ton, effective March 7. No diminution is to be noted in the demand, which continues of heavy proportions. Buyers are clamoring for their material which producers are not able to ship quite as promptly as they would like owing to the scarcity of cars. We have revised our quotations, and quote to jobbers, Chicago delivery, as follows: Wire nails, carload lots, $2.10; less than carload lots, $2.15; cut nails, carload lots, 1.86½c base; less than carload lots, 1.91½c; smooth wire, carloads, $2, and $2.05, for less than carload lots; galvanized smooth wire, $2.30 in carloads, and $2.35 in lesser amounts; painted barbed wire, $2.40 carloads, and $2.45 in less than carload lots; galvanized barbed wire, $2.70 carloads, and $2.75 less than carload lots. Staples, polished, carloads, $2.25; less than carload lots, $2.30; galvanized, $2.55 carloads, and $2.60 less than carload lots. Bale ties, 82½ and 5 percent discount, f. o. b. Waukegan, Ill., on straight carload lots. Poultry netting ,85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Foundry Coke.—The scarcity of cars at ovens has stimulated the demand in this market, and not only is the tonnage closed of greater proportions, but better prices are obtained. Good grades of 72-hour Connellsville are being offered in this market from $4.65 to $4.90 Chicago, and Southern cokes at slightly lower prices.

Old Material.—While the demand from mills has been of a quiet order, the inquiries from foundries for stove plate, heavy cast and malleable scrap has been heavier than for several weeks. There is also a fair demand for rails for re-rolling purposes and relaying rails are also improving. We have revised our prices of last week, which were too low. We quote dealers' selling prices, gross tons, as follows:

Old iron rails	$16 00 to 16 50
Old steel rails (mixed lengths)	11 50 to 12 00
Old steel rails (long lengths)	13 00 to 13 50
Relaying rails	23 00 to 24 00
Old wheels	12 50 to 13 00
Heavy melting steel	11 50 to 11 75
Mixed country steel	9 50 to 10 00

The following are selling prices for net tons:

Low phosphorus scrap (.04 and under)	12 00 to 12 50
No. 1 R. R. wrought	13 00 to 13 50
No. 2 R. R. wrought	11 50 to 12 00
Shafting	13 50 to 14 00
Dealers' forge No. 1	10 75 to 11 00
No. 1 busheling and wrought pipe	8 50 to 9 00
No. 1 cast	11 50 to 12 00
Heavy cast (300 pounds and over)	8 50 to 9 25
Agricultural malleable	9 00 to 9 50
Iron axles	16 50 to 17 00
Steel axles	15 00 to 15 50
No. 1 boilers, cut	8 50 to 9 00
Cast borings	5 25 to 5 75
Mixed borings, etc	5 25 to 5 75
Wrought turnings	8 00 to 8 50
Machine shop turnings	8 00 to 8 50
Iron axle turnings	9 00 to 9 50
Steel axle turnings	8 50 to 9 00
Stove plate and light cast scrap	9 50 to 9 75
Old iron splice bars	13 00 to 13 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, March 8

More cheerful than for many weeks are the reports from all branches of the iron and steel business except in iron ore, concerning which nothing has been done. The demand in nearly all lines has increased, prices are firmer and in some cases higher and prospects for new business are bright. There is serious congestion of freight cars at important railroad centers, many thousands of cars being sidetracked on account of railroad companies not having sufficient motive power to move them. Great difficulty is being experienced in giving prompt delivery, for which buyers, who have followed a hand-to-mouth policy, are clamoring. This is especially true of coke and a large number of foundries are embarrassed on account of inadequate supplies. During the past few days the United States Steel Corporation has been insistent in urging furnaces from which the recent purchase of Bessemer pig was made to deliver the iron. Neither the furnaces nor the railroads are allowed to lag. No stronger evidence than this activity of corporation representatives could be presented to prove that it really needed the iron.

Iron Ore.—The committee meeting of representatives of the leading ore interests held in New York last Monday adjourned till April 1 without reaching an agreement. Some of the interests are evidently favorable to a policy of delay, believing that an announcement of lower prices would have a depressing effect on the market for pig iron and finished material and entertaining the hope that, if the present improvement in business continues, it will not be necessary to make so large a reduction in last year's prices of ore as was first contemplated. The meeting at New York on Monday followed a conference at Pittsburg on Wednesday last, on the part of the steel interests and the one merchant ore company that has stood with them on the $4 basis for old range Bessemers, with no restriction in the output of consuming producers, except the limitation of the lessened needs of their furnaces, and with full liberty to producers having long-time contracts to bring down all the ore called for in these, and in addition what they consider their proper proportion of the ore sold in the open market in 1904.

Pig Iron.—Buyers are showing much more interest and prices are tending upward. While last week the usual quotations in the Valley was $12 for No. 2, some furnaces are now holding for $13 and the usual quotation is $12.50. The lowest price reported in the Valley was $12.40. Sales of Northern are not in large volume, but there is a good demand in small orders for prompt shipment. In Cleveland, local furnaces are selling at $12.75 at the plants. Bessemer is selling at $13 to $13.25 and a small tonnage of basic has been sold at about the same price. The report current in some places last week that Superior charcoal pig iron was being delivered at $14.50 was probably due to the fact that one company sold a

little lot of iron to a concern as a trial and made the price $14. This was done, the company states, with the expectation and clear understanding that if the customer obtained certain results he would use the iron at the market price. Sales of charcoal iron continue on the basis of about half the output of the furnaces. The furnaces would be well satisfied with the price which they are getting if the demand would take all that they are making, but as has been stated before, all of the charcoal furnaces have kept constantly in blast, and the demand has not been enough to absorb the output.

Southern furnaces have advanced their prices, the usual quotations being on a basis of $9.50 for No. 2. Heavy sales of Southern iron, foundry and basic, have been made during the past ten days. In this territory a fair tonnage of foundry and gray forge has been disposed of. We quote as follows for Cleveland delivery, save on Northern gray forge, which is at Valley furnace:

Bessemer	$13 85 to 14 10
No. 1 Strong Foundry	13 15 to 13 40
No. 2 Strong Foundry	12 75 to 12 85
No. 3 Foundry	11 90 to 12 25
No. 2 Southern	13 10 to 13 35
Gray Forge, Valley furnace	11 50 to 12 00
Gray Forge, Southern	11 75 to 12 00
Lake Superior charcoal	15 00 to 15 50

Finished Material.—Specifications are coming in freely and the demand in nearly all lines is stronger. The principal producers of bar iron have agreed to advance the price to 1.35c, Pittsburg, which is equivalent to 1.42½c, Cleveland. This agreement includes the local jobbers. As sales have been slow at 1.30c, Youngstown, it is not probable that many orders will be taken at an advance of $2.50 per ton with extras added for amounts less than a ton. The probable result—and the one hoped for by the principal producers—will be the stimulation of the market for steel bars, for buyers, as long as they can get steel at 1.30c for Bessemer and 1.40c for open-hearth, will use it in preference to iron whenever possible. An early advance in the price of steel is not improbable. The principal producer of hoops is declining less than 1.30c and not much business is being done at less than that price. There is strong competition in boiler tubes and the discounts of the principal producers, 64½c for steel and 50½c for iron for tubes, 2¾ to 5-inch, are met by other producers who quote 66c for steel and 52c for iron tubes. The sheet business is in a more satisfactory condition, and some sellers are making smaller discounts on the heavy gauges. Prices of the principal producer through jobbers are as follows: Mill sales of black sheets, No. 10, 1.75c; No. 11-12, 1.80c; No. 14, 1.85c; No. 16, 1.95c; No. 27, 2.20c; No. 28, 2.30c. Galvanized, 80, and 3 off. Out of stock prices are as follows: No. 10, 2.10c; No. 12, 2.15c; No. 14, 2.20c; No. 16, 2.30c; No. 18-20, 2.40c; No. 24, 2.45c; No. 25-26, 2.50c; No. 27, 2.55c; No. 28, 2.65c; No. 30, 3.10c. Galvanized out of stock, 75, 10 and 5 off.

Old Material.—Scrap is scarce. The railroads have been so busy in attempting to relieve the freight congestion that little scrap has been collected and offerings from them are small. Prices are firm and stationary. We quote as follows for gross tons, Cleveland:

Old iron rails	$16 00 to 17 00
Old steel rails (over 6 feet)	13 50 to 14 50
Old steel rails (6 feet and under)	13 00 to 14 00
Old car wheels	13 00 to 14 00
Steel boiler plates	9 00 to 10 00
Malleable iron (railroad)	11 00 to 12 00
Malleable iron (agricultural)	9 00 to 10 00
Heavy steel	11 50 to 12 00

We quote the following net tons:

No. 1 R. R. wrought	$12 00 to 13 00
No. 1 busheling	11 00 to 12 00
No. 1 machine cast scrap	11 50 to 12 00
Iron axles	16 50 to 17 50
Axle turnings	9 00 to 10 00
Wrought turnings (free from cast)	7 50 to 8 25
Uncut wrought iron boilers	5 00 to 6 00
Grate bars	8 00 to 9 00
Pipes and flues (clean)	10 00 to 11 00
Tank iron	9 00 to 10 00
Hoop and band iron	5 00 to 6 00
Sheet iron	4 00 to 5 00
Wrought drillings	7 00 to 8 00
Stove Plate	9 50 to 10 50
Steel axles	13 00 to 14 00
Cast borings	4 50 to 5 50

CINCINNATI.

March 8

There has been decidedly more activity in the coke market the past week and a firmer tone is noted but no actual improvement in prices. Several large contracts have been placed and the fear of a coal strike has been sending in orders from the general run of buyers. Foundry coke is quoted $2.10 to $2.25 f. o. b. ovens, for the best makes.

Pig Iron.—The buying of pig iron has been more active the past week and some furnace interests have withdrawn their quotations of $9 Birmingham for No. 2 foundry. The asking price is now $9.25 Birmingham, for No. 2 foundry, but there are still some furnaces taking business at the $9 price. There is an inquiry in the market for a large tonnage to be placed in Pittsburg this week and it is believed that this will bring out the bottom prices now available. The inquiry is for 7,000 to 8,000 tons of mixed grades. Two sales of gray forge are reported at $7.75 Birmingham, one sale of 2,000 tons and one of 2,500 tons. A pipe manufacturer in the South is reported to have bought 15,000 tons of mixed grades at $9.25 Birmingham, and one selling agency here reports sales for the week aggregating 20,000 tons at both $9 and $9.25 Birmingham. One of the large Southern furnace companies has taken a good share of this business and has advanced its quotation to $9.25 as a minimum basis. In Northern irons there has been nothing of note developed so far as this territory is concerned. There is still enough $9 No. 2 iron to be had to justify the quotation on that basis. Aside from this increased activity there has been no change in the situation. It can hardly be said that the trade has confidence in any higher prices being attained. There is not a feeling of strength and some express the view that an attempt to put up prices will stop the demand that has come into life at the present level of values.

Some of the selling agents report a rather quiet week so that the improvement in demand has not been general or widespread, in fact a good part of the tonnage reported sold was not sold in this territory. Current prices f. o. b. Cincinnati are:

Southern Foundry No. 1	$12 25 to 12 75
Southern Foundry No. 2	11 75 to 12 25
Southern Foundry No. 3	11 25 to 11 75
Southern Foundry No. 4	10 75 to 11 25
Southern Foundry No. 1 soft	12 25 to 12 75
Southern Foundry No. 2 soft	11 75 to 12 25
Gray forge	10 75 to 11 00
Northern Foundry No. 1	13 90 to 14 15
Northern Foundry No. 2	13 40 to 13 65
Northern Silvery (8% silicon)	16 15 to 16 65
Southern car wheel iron	17 50 to 18 00

Finished Material.—No changes in prices are reported and the market in a general way continues quiet. Deliveries are reported slower from steel bar mills. Bar iron is steady and the inside quotation that has prevailed for some time is now withdrawn and carload lots are not now obtained below 1.40c f. o. b. Cincinnati. Bar iron is quoted at 1.35c to 1.40c f. o. b. Steel bars continue to be quoted at 1.43c base, half extras, with the retail price 1.75c to 1.90c for iron and steel out of store. Galvanized sheets are being quoted at 75 and 10 and 5 and 2½ percent off. We quote black sheets, No. 27, at 2.45c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.80c; No. 27, 2.70c; No. 16, 2.45c; No. 14, 2.35c; No. 12, 2.30c; No. 10, 2.25c. Tank plates are easy and sell out of store at 2c for ¼-inch and 2.10c for 3-16 inch. Beams and channels are quoted at 1.90c to 2c from stock and angles at 1.90c to 2c for base sizes.

Merchant pipe is quiet and unchanged. There is not much demand at present but the advance recently established is reported well maintained. Car load lots are quoted as follows:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe.		Guaranteed Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛, ¼, ⅜ inch	66.7	56.7	64.7	54.7
½ inch	69.7	59.7	67.7	57.7
¾ to 6 inch, inclusive	73.7	63.7	71.7	61.7
7 to 12 inch, inclusive	69.7	59.7	66.7	56.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ inch	41.2	37.7
1¾ to 2¼ inch	54.2	36.7
2½ inch	56.7	41.7
2¾ to 5 inch	63.2	49.2
6 to 13 inch	54.2	36.7

Old Material.—There is no quotable change in the market for scrap but the tendency is rather toward firmness and stronger quotations are more to be expected than any change in the near future. Prices to consumers are as follows:

Old No. 1 railroad wrought, net tons	$11 50 to 12 00
Cast machine and foundry, net tons	11 00 to 11 50
Old iron rails, gross tons	16 00 to 16 50
Old steel rails, gross tons	13 00 to 14 00
Old short lengths, gross tons	11 00 to 12 00
Old iron axles, net tons	15 50 to 16 50
Stove plate, net tons	9 50 to 10 50
Wrought turnings, net tons	7 50 to 8 00
Cast borings, net tons	4 00 to 5 00

PHILADELPHIA.

March 8.

There is some increase in demand for nearly all products, but there is no important change in conditions. The recent increase in the output of pig iron has prevented any decided advance. The railroads are not placing orders as freely as it was hoped they would.

Pig Iron.—The market is firmer, but prices are about the same as last week. The demand for foundry and low grade irons is good. No. 2 foundry is selling rather freely at $14.75 delivered, and No. 2 plain at $14. Some brands of No. 2 X command $15. Competition with Southern furnaces keeps prices down. The demand for basic has improved. The recent sale of Bessemer pig to the United States Steel Corporation has not had much effect in this city. The danger of a strike of the soft coal miners and the failure of the ore interests to agree on prices are uncertain factors at present. We quote as follows: No. 1 X foundry, $15.25 to $15.75; No. 2 X foundry, $14.50 to $15; No. 2 plain, $14 to $14.25; Southern No. 2, rail shipment, $13.75 to $14; Southern No. 2, on dock, $13.25 to $13.50; Standard gray forge, $13.50 to $14; ordinary gray forge, $12.75 to $13; basic, $13.75 to $14.

Steel.—The demand for billets is strong. The Wilmington and Chester mills are not in operation and only one mill in this locality is able to accept orders. Prices are firm at $14.25 to $25, delivered.

Finished Material.—There is not great activity, but some improvement can be noticed, especially in bars. Plates and structural material are more active and prospects are very encouraging. Prices are unchanged as follows: Bar iron, 1.43½c to 1.45c; steel bars, 1.45c to 1.50c; small angles, 1.50c to 1.55c; beams, channels and angles, 1.73½c to 1.85c.

Old Material.—Prices are firm and tending higher, but this condition is probably due to temporary scarcity, which will soon be relieved. We quote, delivered prices: Old steel rails, $14 to $15; miscellaneous heavy steel, $13.50 to $14.25; old steel axles, $16.50 to $17; old iron axles, $19 to $20; old iron rails, $15.50 to $16.50; old car wheels, $13 to $14; choice R. R. No. 1 wrought, $17 to $18; country scrap, $16 to $17; machinery cast, $13 to $13.50; No. 2 light scrap (forge), $11 to $11.50; No. 2 light scrap (ordinary), $9 to $9.50; axle turnings, $10 to $10.50; wrought turnings, $9.25 to $9.50; cast borings, $7.25 to 7.50; stove plate, $11.50 to $12; wrought iron pipe, $12.50 to $13; boiler punchings, $15.50 to $16.50.

NEW YORK.

OFFICE OF *The Iron Trade Review*.
ROOM 1909, NO. 150 NASSAU ST., March 8.

The Bessemer Ore Association held its fourth meeting at the office of President Corey of the United States Steel Corporation in this city yesterday, for the purpose of fixing the price schedule for the present year, but adjourned to April 1 without coming to any agreement. Those in attendance included the following: First Vice President Gayley, of the United States Steel Corporation; A. W. Thompson, president of the Republic Iron & Steel C.; W. P. Snyder, of Pittsburg; Powell Stackhouse, president of the Cambria Steel Co.; Price McKinney, of Corrigan, McKinney & Co.; W. G. Mather, of the Cleveland-Cliffs Iron Co.; Samuel Mather, of Pickands, Mather & Co., and L. B. Miller, of Oglebay, Norton & Co., of Cleveland.

Pig Iron.—The feature of the market for the week was the strength of Southern irons, which less than a week ago were exceptionally vulnerable. One large interest which reduced the price of No. 2 Southern foundry from $9.50 to $9.25; Birmingham last Wednesday, has notified its agents to make the former price the basis of all sales for delivery until July 1. There are other furnaces which have adopted the $9.50 schedule also, but one of the largest interests has been taking and is willing to take business at $9.25. From all accounts the latter is the usual minimum figure at this writing, whereas a week ago $9 could be done without much difficulty. The improvement we have noted is due to orders for large tonnage which Southern interests have recently booked. The Sloss-Sheffield Steel & Iron Co., for example, has received orders for 55,000 tons since March 1, but of the No. 2 foundry which figures in this, the greater part was taken at $9.25. Other companies report having taken some excellent orders also. In Northern irons as more activity appeared prices suffered. It was thought that in consequence of the United States Steel Corporation's recent and prospective purchases, and the better aspect of Southern brands, the iron market would be stronger all around, but Northern furnaces, so far as advices here go, have had a contrary experience. Consumers are still buying on the hand-to-mouth plan, and are still unwilling to listen to overtures concerning extended delivery. New York prices are as follows: No. 1 X, $15.00 to $15.25; No. 2 X, $14.50 to $14.75; No. 2 plain, $14.25 to $14.50; Southern No. 1 foundry, $13.50 to $13.75; No. 2 foundry, $13.00 to $13.25; No. 3 foundry, $12.50 to $12.75; No. 4 foundry, $12.00 to $12.25.

Rails.—No sales of any consequence can be noted, but it is announced that some business is in excellent shape for early closing. Orders for small lots are coming in fairly well. Standard sections remain $28 at mill.

Finished Iron and Steel.—In structural shapes no business of any magnitude has been closed, but one contract from the South aggregating about 3,000 tons is likely to be closed at any time. There are some excellent orders in sight, but no immediate prospect of bringing them to a head. In plates, current business shows a slight improvement. Sheets are only fairly active, and there are jobbers who do not hesitate to shade prices when a good order can be booked. A better situation prevails in refined iron and soft steel bars, and there is an intimation that the price of the latter will shortly be advanced. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 1.74½c to 1.80c; flange, 1.84½c to 1.90c; firebox, ordinary, 1.94½c to 2c; refined iron bars, 1.45c to 1.50c; soft steel bars, 1.45c to 1.50c; steel sheets, in carloads, New York, No. 28 black, 2.45c to 2.50c; galvanized, 3.50c to 3.55c.

The Metal Market.

OFFICE OF *The Iron Trade Review*.
ROOM 1909, NO. 150 NASSAU ST., NEW YORK, March 8.

Pig Tin.—The metal has been very quiet during the past week, and the business placed has been of very meagre proportions. In trade circles opinions as to the outlook are of a pessimistic character, due to the statistical situation being unfavorable, and to the approach of mild weather, which invariably produces dullness. In London the market has been without feature, with prices showing a downward tendency. Closing prices at the Metal Exchange today were as follows: Spot, 28 to 28¼c; March, 27.35 to 27.50c; April, 27.00 to 27.50c. London's closing today follows: Spot, £123 17s 6d; futures, £124 5s. Arrivals at Atlantic ports for the month to date amount to 1,375 tons, with 3,362 tons afloat.

Copper.—During the week the market could not have been any duller than it was, and in the keen competition for orders, the "official" prices were shaded ¼ to ¼c. The general situation is of a most discouraging character, and brokers are not at all convinced that an early improvement can be looked for. In London the market has been dull, with prices inclined to be easier. Closing prices at the Metal Exchange today follow: Lake, 12½ to 12¾c; electrolytic and casting, 12⅜ to 12⅝c. London's closings today follow: Spot, £56 15s; futures, £55 15s. Exports for the month to date aggregate 3,454 tons, against 2,517 tons for a similar period last year.

Lead.—Is steady at 4.60c to 4.65c. St. Louis is strong at 4.47½c. London is firm at £12.

Spelter.—Is stronger at 5.00c to 5.10c. St. Louis is steady at 4.80c. London is stronger at £22 5s.

Antimony.—War conditions still continue to keep prices strong. Cookson's is 7¾c to 8c; Hallett's, 7c to 7¼c, and other brands, 6¼c to 6½c.

Quicksilver.—We quote $46 per flask of 76½ pounds in lots of 100 flasks. London is £8 5s.

Nickel.—Sales are made at 40c to 47c for large lots down to a ton, and at 50c and 60c for smaller quantities.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK March 8

There is litle change to be noted in the local metal market. Demand is of moderate proportions, consumers covering only for immediate requirements. Both lead and spelter are firmer on account of their scarcity. Prices are without material change, and we quote Lake, 13c to 13⅛c for carload lots, and 13¾c to 14c for lesser lots; casting carloads, 12½c to 12¾c; less than carload lots, 12¾c to 13c. Pig lead, 4.45c in carload lots, and 4.50c to 4.55c in lesser quantities. Pig tin, carlots, 30c, and lesser quantities, 30½c. Spelter, 5c carloads, and 5¾c to 6c for lesser amounts. Sheet zinc, 5.65c per 100 pounds for 600-pound casks, with 20c advance for less than carload lots. Antimony—Cookson's 8½ to 8¾c; Hallet's, 7¼c to 7½c. Nickel, 45c to 60c according to amount and deliveries. Demand for old metals is improving and prices are somewhat firmer. We quote copper wire and heavy, 11c; copper bottoms, 10c; copper clips, 10½c; red brass, 9⅞c; yellow brass (heavy), 7¾c; yellow brass borings, 6c; red brass borings, 8c; light brass, 5½c; pipe lead, 4c; tea lead, 3¾c; zinc, 3¼c.

Civil Engineering Reject Carnegie Proposal.

By a vote of nearly two to one last week, the American Society of Civil Engineers rejected Mr. Carnegie's offer of a union engineering society building. The letter ballots were opened at the regular meeting held March 2, and out of 1,801 votes legally cast and counted, 1,139 were against the acceptance of the gift and 662 were in favor of it.

It is something of a coincidence that on the previous day, March 1, the secretary of the American Institute of Mining Engineers notified the members of the adoption, subject to postal ballot, of such amendments to the rules as would enable the organization to accept a share in the property. The following amendment was substantially stated in advance in a statement signed by all the members of the council as individuals on June 10, 1903. The postal ballot in response to that statement showed more than 99.25 percent in favor of the amendments. The amendments are now submitted for final adoption by postal ballot. The amendment reads as follows: "And the council is hereby authorized to give its assent and cooperation to the generous offer of Andrew Carnegie, a member of this institute, to provide a building in the City of New York for the use of American engineering societies; and in case a corporation should be formed to own and administer such building, the council is authorized to name representatives for the institute in the managing board of said corporation."

No Bituminous Coal Strike.

It is now a certainty that there will be no strike of the United Mine Workers of America, despite the disagreement at the conference held in Indianapolis last week. The mine workers have issued instructions to their locals in the bituminous fields of Pennsylvania, Ohio, Indiana and Illinois to vote on the proposition offered by the operators on March 15. The vote will be counted on March 17 and the result of the balloting will be known on the same day. The operators offer the mine workers a reduction of 5.55 percent from last year's scale on a two-year agreement, and the officials of the organization most strongly urge the miners to accept the same. Another conference between the miners and operators will be held on March 21 when the vote of the locals will be given officially to the operators.

A receiver has been asked for the Sheriff Machinery & Supply Co., Pittsburg. The company is capitalized at $50,000, with $20,000 preferred and the remainder common. The assets are $13,000. The liabilities are reported to aggregate $20,000.

PITTSBURG FOUNDRYMEN'S ASSOCIATION.

At the meeting of the Pittsburg Foundrymen's Association, held at Pittsburg, on Monday evening, March 7, Thomas D. West, of Sharpsville, Pa., read a paper on "Fan Power for the Cupola." The questions taken up by Mr. West proved of intense interest to all present and a lively discussion followed the reading. It developed that there was no fixed method of ascertaining the power for driving a fan under the variable conditions connected with cupola practice and there was a wide divergence of opinion on the subject of piping. In addition, the rotary pressure blowers had their supporters and numerous experiences were related, no two being alike. Owing to the interest manifested in the subject it was decided to gather additional information and a committee of three, consisting of Thomas D. West, W. H. McFadden and A. O. Backert, was appointed for the purpose of securing the experiences of foundrymen all over the country on the use of fans and blowers for operating their cupolas, with a view of later arriving at some formula that can be used by all foundrymen for ascertaining the power they require under all conditions. An effort will also be made to arrive at some definite conclusion as to the efficiency and economy of using a blower in the place of a fan and vice versa. One large foundry in Pittsburg using a fan will permit the use of its cupola for the making of these experiments provided a pressure blower can be secured. It is the intention to make these tests under exactly the same conditions, and it is believed that information of great value to foundrymen in general will result from these investigations and experiments. Lunch was served after the meeting. The following were in attendance:

A. W. Slocum, National Car Wheel Co.
B. D. Fuller, Westinghouse Electric & Mfg. Co.
T. E. Malone, J. S. McCormick Co.
J. S. Seaman, Seaman-Sleeth Co.
Wm. Yagle, Yagle Foundry & Machine Co.
J. Frazier.
John McLaren, Phillips & McLaren.
Mr. Schade and Mr. Schade, Jr., Braddock Machine & Mfg. Co.
A. O. Backert, *The Iron Trade Review.*
Thos. D. West, Thos. D. West Foundry & Machine Co., Sharpsville, Pa.
Mr. West, Jr.
W. J. Spilker.
D. J. Thomas, Sterrit-Thomas Foundry Co.
Paul W. Hay, Whiting Foundry & Equipment Co.
E. G. Seaman, S. Obermayer Co.
Wm. H. McFadden, Mackintosh-Hemphill & Co.
A. M. Moran, American Bridge Co.
S. D. Sleeth and Jno. A. Schick, Westinghouse Air Brake Co.
L. E. Dunlap and Wm. Hanna, Mackintosh-Hemphill & Co.
J. H. Robinson, Pittsburg Mfg. Co.
H. S. Ridenour, Thos. Carlin Sons Co.
John Birch, Pittsburg Malleable Iron Co.
James Keegan, Frank-Kneeland Machine Co.
W. A. Kearns.
Samuel McMillen, Machintosh-Hemphill & Co.
Mr. McMillan, Damascus Bronze Co.
Daniel Ackerman.
Geo. P. Maury, Metallurgical Laboratory.
W. J. Dorsey, Enterprise Foundry Co.
S. B. Marshall, L. & R. Wister & Co.
James Sloss, Braddock Machine & Mfg. Co.
James Saville, Sterrit-Thomas Foundry Co.
W. J. Naeser, Yagle Foundry & Machine Co.
W. J. Shaw.
C. B. Seaman.
J. Fox, H. K. Porter & Co.
C. G. Smith, Chas. G. Smith & Co.
E. F. Luke.
Mr. Ottoway.
J. F. Koppke.
J. C. Warne, Pennsylvania Casting & Machine Co.
Mr. Seaman, Jr., and Mr. Slocum, Pennsylvania Malleable Co.
Mr. Bitler.
Mr. Nichols.
F. H. Zimmers, Union Foundry & Machine Co.

A bill was introduced in the State assembly at Albany, on March 4, imposing a tax of $2 per horse power upon all electricity distributed in the State of New York that is generated in a foreign country. This bill, if enacted, will chiefly effect the power companies on the Canadian side at Niagara Falls, and would yield a revenue to the State from that source of $250,000 annually.

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OPERATING COSTS AND "DUMPED" PRODUCT.

A correspondent in last week's issue made some observations on the question "What is a manufacturing cost?" suggested by an article in this department a few weeks ago. His remarks are well worth studying as there is far from the uniformity there should be in the way practical men regard this subject, and his communication moves us to elaborate a little on one or two points referred to only briefly in the original article. A new point in accounting is the system of reporting profits which the plan of organization of the United States Steel Corporation has brought out. The current "net earnings" of the corporation are determined after interest has been paid on bonds and other fixed charges of subsidiary companies, while the principal of these same obligations is provided for out of such earnings, partly by direct deduction of sinking fund charges, and partly by payments from depreciation funds and from the ascertained surplus. Our correspondent asks the question: "And these mortgages of subsidiary companies, and purchase money obligations, are they not, or should they not be, provided for by the profits of the subsidiary companies?" Obviously he expects a categorical answer, in which he is right, yet the steel corporation has made fish of the interest and fowl of the principal.

To the lay mind, the United States Steel Corporation is a manufacturing enterprise. To its expert accountants, outside of the point just referred to, it is a holding company. Hence a distinction is made between different classes of bonds. Interest on subsidiary bonds comes before earnings are ascertained; interest on steel corporation bonds are paid out of "net earnings." The distinction of whether a bond can be foreclosed on a piece of real estate with the property thereon, or on a block of stock, is hardly obvious enough, from a commonplace standpoint, to make such a difference in the class of income from which its charges should be deducted.

The question of "What is a manufacturing cost?" is further broadened by the fact that it can be asked in very different connections. The expert accountant may ask it of himself after a year of operation has been accomplished. That is one thing. The sales department may ask it in connection with a particular order, the acceptance of which is under consideration. That is a totally different matter. In the first case, the manufacturing cost is an average over a period of time and over a range of tonnage. In the second case, the sales department wants to know something entirely different: "What will be the particular expenditure in making this particular tonnage?" as in the case of dumping some export material. With a company operating a single plant that expenditure will be small, and the cost per ton of the additional material will be very low, lower than the average of the total product. With a company operating many plants the case may be entirely different. The most economical plants may already be in full operation; the filling of the order under consideration may require the starting of a much less economical plant, in which case the extra cost in this connection may more than destroy the advantage of reduction in general charges.

Assume a case. Suppose a company has 11 plants, each capable of producing 100 tons a day. The factory cost of 100 tons at the first plant is $100, of the second $105, of the third, $110, of the 11th, $150, or $1.50 per ton, while the average of all is that of the 6th, or $1.25 per ton. Then, running full, the cost of 1,100 tons is $1,375, or $1.25 per ton. If the fixed charges of the company are $275 per day, then the whole cost is $1,650, or $1.50 per ton. Obviously the elimination of the 11th plant, where the factory cost is $1.50 per ton, leaves the 10 plants operating and paying fixed charges, with a total cost still of $1.50 per ton. Cut off another plant, however, and the cost at nine plants averages $1.50 5-9 per ton, and as each additional plant is cut off the average cost is increased.

Now assume that the fixed charges are less than $275 per day; say they are $165 per day. Then the total charges, running full, are $1,375 plus $165 or $1,540, equal to $1.40 per ton, which, being less than the factory cost at the 10th and 11th plants, shows that they can be cut off to advantage, and this advantage is only lost when the 9th, which is about neutral, and the 7th and 8th are cut off. The cost per ton, paying $165 fixed charges, would be as follows: 11 plants, $1.40; 10 plants, $1.39; 9 plants, $1.38 1-3; 8 plants, $1.38⅛; 7 plants, $1.38 4-7; 6 plants, $1.40. With a still smaller number of plants in operation the cost per ton would continue to increase.

Were 8 plants in operation, showing the minimum total cost per ton of $1.38⅛, it would not pay for the sales department to accept an order to be filled in the 9th plant, at $1.39 per ton, although that would be above the average cost, even with 9 plants in operation, because it would pull up the average at the preceding 8 plants. It would be necessary to secure $1.40 per ton, the factory cost at this 9th plant, and even then there would be no contribution towards fixed charges. Nothing would be gained. This is the problem with "dumped" material. The price secured must not be the factory cost at the most economical plant, but the factory cost at that less economical plant which would remain idle if the order were not taken, and even then there is no contribution towards fixed charges.

PERSONAL.

George J. Chandler, for the past ten years identified with the Cleveland Steel Casting Co., has recently resigned his position of secretary and assistant treasurer of that company, and hereafter will devote his time to the brokerage business. The new firm will be known as Geo. J. Chandler & Co., and will locate at 452 The Arcade, Cleveland, doing a general brokerage business in iron and steel scrap and foreign alloys.

Harry N. Pendleton, manager of the Boston plant of the National Tube Co., Pittsburg, has resigned. W. A. Hurley has been named as his successor.

On Friday evening, March 4, the 35 department heads of the Kiskiminetas Valley plants of the American Sheet & Tin Plate Co., tendered a banquet to their former manager, Eugene V. Pargny, at Vandergrift Inn., Vandergrift, Pa. Upon the consolidation of the American Sheet Steel and American Tin Plate companies, Mr. Pargny was appointed to the position of second vice president in charge of sales. A beautiful album of unique design was presented Mr. Pargny containing photographs of each department head.

Joseph W. Keffer recently resigned as manager of the Republic Iron Works, Pittsburg. He was connected with this plant for 21 years and upon his retirement was presented with a gold watch chain and locket.

H. Mori, one of the chief engineers of the locomotive department of the Japanese Government railways, is now in the United States on a tour of inspection of locomotive works, railroad shops, etc. He was in Pittsburg last week.

William Morrison, of Toledo, who recently organized the Morrison Iron Co., of Norwalk, O., has taken charge of the business of that company and succeeds A. Rotter. Mr. Rotter continues to hold an interest in the business.

W. S. Gorton, secretary and general manager of the Standard Welding Co., of Cleveland, has returned from a European trip.

H. S. Manning, of Manning, Maxwell & Moore, Cleveland, has gone on a trip to Cuba.

J. J. Shannon has been appointed general furnace manager for the Sloss-Sheffield Steel & Iron Co. He formerly held a similar position with the Alabama Steel & Wire Co. He is succeeded at Gadsden by William Acuff, of Dayton, Tenn.

David Baker, who for the past 19 years has been engaged in iron and steel operation, 15 years of that period being spent in the construction and management of blast furnaces for the Pennsylvania Steel Co., Maryland Steel Co., Illinois Steel Co., and the past two years the Dominion Iron & Steel Co., opened an office as consulting engineer on March 1, at 1510 Real Estate Trust building, Philadelphia. His work will be particularly in the lines of blast furnace construction and management, coal washing, coking, lime burning and the quarrying of blast furnace flux, and mechanical unloading from vessels, in addition to dock construction. Mr. Baker is associated with James B. Ladd, who for a number of years has been engaged in consulting engineering in Philadelphia.

W. Aubrey Thomas, of Niles, O., of the well-known family of iron manufacturers, is a candidate for Congress, to succeed Hon. Charles Dick, of Ohio, who resigns to take his seat in the Senate as Senator Hanna's successor.

Philip Farnsworth has removed his offices to 150 Nassau street, New York, and will continue there the practice of general patent law. He was for a time local counsel at Schenectady, N. Y., for the General Electric Co., and later practiced in Washington, D. C., making a specialty of patent law. He is a son of C. B. Farnsworth, the well-known New Haven, Conn., foundryman.

E. S. Mills and H. E. Tener Jr., sail from Boston, March 12, on the Canopic, White Star Line, for a European trip.

A. Kennedy Ashworth, has resigned as assistant manager of the Underfeed Stoker Co., Chicago, to accept the New England agency of the Buckeye Engine Co., Salem, O. His headquarters will be Hancock building, Boston.

F. Baskerfield, St. Louis, manager of the Crucible Steel Co. of America, sails from Boston March 12 for several week's vacation in Europe.

The furnace of the Brier Hill Iron & Coal Co., Youngstown, O., resumed operations this week.

OBITUARY.

Wm. A. McGuire died at his home in Chicago, Feb. 29. He was born in Niagara, Canada, in 1840. In 1863 he went to Chicago where he engaged in the iron manufacturing business and founded the McGuire Mfg. Co.

John Wrigley, one of the oldest and best known machinists in New Jersey, died Feb. 27 at Paterson, N. J. He was born in Oldham, Engiand, in 1815. When ten years old, he came to this country, soon starting to work in the Rogers Locomotive shops. He took pride in the fact that he helped to erect the first locomotive built in Paterson. In later years he was engaged in business for himself, manufacturing links, chains and washers and conducting a general machine business. He retired from active work in 1898.

George Downing, pioneer foundryman of Rock Island, Ill., died Feb. 25 at the home of his son in Talmage, Kan. Mr. Downing was 81 years of age and had lived almost 50 years in Rock Island, where he established the Downing foundry and was active in its management until seven years ago, when he retired.

Russel Wheeler Davenport, general manager of the Cramp Shipbuilding Co., Philadelphia, died March 2, of pneumonia. Mr. Davenport was a distinguished metallurgist and rendered valuable service in perfecting plans for the equipment of the modern navy of this country in armor plate and ordnance. He was born in Albany, N. Y., Nov. 26, 1849, and in 1871 graduated from the Sheffield Scientific School at Yale, at which time he was appointed assistant to Prof. Brush, of the scientific school of metallurgy. In 1873 he became general manager of the Midvale Steel Works. In 1887 Mr. Davenport took charge of the armor plate and ordnance department of the Bethlehem Steel Co., which position he filled until October, 1902, when he resigned to take a well earned rest. This lasted until June, 1903, when he assumed the position of general manager of the Cramp shipyard. In 1894 he received the honorary degree of master of arts from Harvard in recognition of his services in the development of great guns and of armor plate which has been the admiration of the world. In 1898 his alma mater honored him with a similar degree. Throughout his life he was in constant communication with the Government, which sought his advice and co-operation in the building of the navy.

John S. King, business manager of the *Iron Age* and the *Metal Worker*, of New York, died at his home in Brooklyn, on March 4. He was born at Middletown, N. Y., on Oct. 1, 1841. As a young printer, he answered the first call for volunteers in the Civil War and enlisted as a private in the 18th regiment of New York Infantry. He served until the regiment was disbanded, when he re-enlisted, entering the 124th New York as a first lieutenant. He was wounded by one of the last shots fired in the battles before Richmond before its surrender. His injury confined him to the hospital for many months and frequently incapacitated him in recent years. In 1868, he went to New York and the year following became business manager of the *Iron Age* and allied publications of David Williams. In 1898, when the David Williams Co. was formed, he was made treasurer. He was also treasurer and general manager of the Williams Printing Co.

Wm. Toothe, vice president of the Nathan Mfg. Co., New York, died on Jan. 24, in his 73d year. He was born in Birmingham, Warwickshire, Eng., and learned the metal and electroplate with his father. He went to Brooklyn, N. Y., as a clerk in 1852 and a year later was in the real estate business at Chicago. This led him into an investigation of Government land frauds in Iowa, in exposing which he was brought to the attention of the public as a forceful writer, which led to his becoming city editor of the Chicago *Times*. He went to New York City later and engaged with Thomas Prosser & Sons, and was the first to introduce Krupp tires in America. Severing his connection with this firm he went to the old firm of Nathan & Dryfus, which, in 1884, was succeeded by the Nathan Mfg. Co., in which firm, from that date to the time of his death, he was vice president. He was one of the most widely known railroad supply men in the country.

The Montreal Steel Co. has passed its common dividend, but declared its regular preferred dividend.

The Labor Situation.

CRITICAL WAGE SITUATION AT TIN PLATE MILLS.

(Special Telegram.)

PITTSBURG, Pa., March 9.—An important meeting of the advisory board of the Amalgamated Association of Iron, Steel and Tin Workers is being held at organization headquarters today for the purpose of considering the situation in the sheet and tin plate trades as affecting the association. The outcome of the meeting can only be guessed at this writing, but it is known that some of the trustees are in favor of calling a special convention of the tin lodges within a few weeks, while others are in favor of an immediate special convention of delegates from all the lodges for the purpose of deciding upon some policy which will avert further trouble and loss of lodges. Yesterday the Mountain City lodge of the Amalgamated Association, composed of employes of the Ætna-Standard sheet mill of the American Sheet & Tin Plate Co., held a meeting at Martins Ferry to consider a proposition from the company for another reduction of 10 percent, in addition to the 10 percent reduction made at the first of the year. President Shaffer attended the meeting and stated that the reduction could not be accepted unless it was made general. If this reduction had been accepted the entire plant, consisting of 24 mills, would immediately have been placed in operation. In the tin plate trade it is necessary that reductions in wages be allowed in order that the independent mills can operate in competition with the mills of the American Sheet & Tin Plate Co. At Avonmore, Pa., where the Alcania Co. put into operation a profit-sharing plan, which was declared a violation of the scale by the advisory board of the association, all the men have returned to work and, according to their statements, are receiving the Amalgamated scale. It has been hinted, however, that the scale provisions are being evaded and an investigation into this matter will be held at Amalgamated headquarters on Saturday. If it is learned that the scale is being evaded the lodge will have its charter withdrawn.

The loss of sheet and tin mills to the association in the past year and the threatened loss of other mills make the situation most critical. The sheet plant of the Stark Rolling Mill Co., Canton, was lost to the association early in this scale year, and the McKeesport Tin Plate Co.'s plant, McKeesport, Pa., was afterwards lost after a prolonged strike. The sheet mill of the Muskingum Valley Iron & Steel Co., Zanesville, O., was next lost and the strike at the plant of the Parkersburg Iron & Steel Co., Parkersburg, W. Va., has been practically lost. In addition the Standard Tin Plate Co., Washington, Pa., threatens to operate non-union unless concessions in the present scale are granted, while the McClure Tin Plate Co., Washington, Pa., and the Pope Tin Plate Co., Steubenville, O., also want concessions.

The advisory board of the Amalgamated Association is in session this afternoon with officers of the American Sheet & Tin Plate Co. in the Frick building. The question under consideration is a further reduction of wages in sheet and tin plate mills, in view of the developments outlined above.

NO CHANGE IN IRON MILL WAGES.

(Special Telegram.)

YOUNGSTOWN, O., March 9.—The committee representing manufacturers and employes finished this morning its examination of the records of bar iron shipments in January and February, and announces that there is no change from the 1.30c basis which determined wages in January and February. The puddling rate therefore remains at $5.25 for March and April.

Iron rolling mills in this district are being operated rather more fully, running now at about two-thirds capacity.

EIGHT-HOUR BILL DISCUSSED.

At a meeting of committee on labor of the National House of Representatives March 3, C. M. Fay, of Chicago, who is president of the Fay-Sholes Co., manufacturer of typewriters, and vice president for Illinois of the National Association of Manufacturers, opposed the eight-hour bill with much vigor. He discussed the bill from four standpoints—those of the Government, manufacturer, laborer and general public—in connection with which he treated the questions of whether or not it is right, expedient or practicable. The practicability of the measure from the Government's standpoint would depend upon a system of spying which would condemn it in the minds of the people. Coming to the manufacturers' side of the case, Mr. Fay said he had an inherent right to make goods upon either an eight-hour or a ten-hour basis.

"My plant in Chicago is run ten hours per day and my men are perfectly willing to labor that long. Shall I be penalized every time one of my men works more than eight hours per day? That matter lies wholly between me and my employes."

If the bill were passed, Mr. Fay said, he would never again touch a piece of Government work, and it would be inexpedient for most other manufacturers to do so. "There is dirt enough and fraud and evasion enough in Government contract work now," he declared, "without this committee putting a premium upon bribery and corruption."

As to the practicability of the proposition, from Mr. Fay's standpoint as a manufacturer, that would be out of the question. "Where will the operation of the bill stop?" he asked. "When the Government contracts for food with the Armour Packing Co. shall that food be traced by inspectors back to the farm and the original producers compelled to work not more than eight hours a day?"

I. W. Jenks, representing the steel hoop interests of the Carnegie Steel Co., declared to the committee that the bill would increase the cost of Government work 15 or 20 percent. He told of the difficulties involved in the making of iron and steel under the terms of the bill; how thousands of dollars would be lost because a man engaged in a particular operation could not labor more than eight hours. These things, he said, occurred every day and would not be subject to the emergency clause of the bill. It would be impossible, he said, to work eight hours on Government contract work and longer on private work. The adoption of the eight-hour system would cause all sorts of confusion in changing shifts of men. He said he would rather have the last two hours' work of a man than the first three, as the men get warmed up to their work. Under the eight-hour bill much time would be lost and the other difficulties were numerous.

A. R. Hunt, general superintendent of the Homestead Steel Works, said to the committee that it was necessary in the steel business to keep busy continuously and that if his employes could only work eight hours instead of twelve, as at present, there would have to be an additional number of men amounting to 33 1-3 percent. This vacancy, he said, could not be filled by native labor, as the supply was not greater than the demand now, so that a large number of foreign workmen would have to be imported. This, he said, the unions would object to.

The second point was that 15 percent of the 7,000 employes of the Homestead mills were stockholders in the concern. "Now can the Government prohibit an owner of a business from working at that business as long as he chooses?" he asked. "I think not. But if not the rest of our employes who are not part owners would feel aggrieved because they were not placed on an equal footing with their companions."

Mr. Hunt claimed that the workmen in his mills were not employes of the Government, though they might be engaged on Government contract work. He denied that the output would be increased under an eight-hour system, saying that whatever increase in output there had been in cases where shorter hours were the rule was due to improved machinery and methods. The men, he said, were the same. They could stand twelve hours' labor without trouble, as much of the work was performed by touching a lever which did the business. He said most of the men in his plant do not favor the eight-hour bill.

Taking up the provision for inspection of work, Mr. Hunt said that only six or eight inspectors were kept at Homestead by the Government, although Government work was being done in every department of the mills. He spoke of the great crowd of inspectors that would be necessary to watch his 7,000 employes under the provisions of the eight-hour bill. He asked why Government officials had not been called upon to give their views about the measure.

A. B. Farquhar, of York, Pa., a manufacturer of agricultural

machinery, spoke on behalf of the National Association of Manufacturers. He denounced the theory upon which the bill is based as false.

Great interest was shown in the hearings last Thursday. There was a running fire of questions from attorneys interested, including former Secretary of the Navy Hilary A. Herbert, who represents shipbuilding interests.

Before going into executive session the committee received a suggestion from Judge J. K. Cameron, representing shipbuilding and steel companies, that it report a resolution to the house calling upon the secretary of commerce and labor to investigate and report to Congress upon the provisions of the pending bill, the necessity or advisability of its passage, its effects upon the Government, contractors, employes and the public; the advisability of confining the bill to only a few industries and the wages and other conditions prevailing in English shipyards and manufacturing institutions.

In making this request Mr. McCammon said: "Similar requests are made by other committees of both houses to heads of departments concerning the army, navy, postal and Indian service, rivers and harbors, etc. Before enacting tariff legislation schedules are prepared by experts in the treasury department, full reports are made by technical men, investigations are made, sometimes by commissions, none of which have ever been seriously done by any committee with regard to this proposed legislation."

This request was not acted upon. During executive session a proposition was made by Representative Caldwell to close hearings March 10, but this was not agreed to.

The committee on March 4 continued to hear arguments. Daniel Davenport, of Bridgeport, the executive agent of the American Anti-Boycott Association, and appearing especially for the Citizens' Industrial Association of America, made the principal argument against the bill.

"The principal point that I desire to call the committee's attention to in this bill," said Mr. Davenport, "and the one which to my mind is the most obnoxious feature in it, is the fact that by its terms—and this is something that I am sure every one does not understand—it would rob the workingman of the right to work more than eight hours a day if he wanted to. Let me say to you that if shall come to pass that any member of the union so ably represented here by Mr. O'Connell, when a job has to be done for the Government, is told that he cannot have the privilege of working overtime on that job, for the overtime pay, he will resent it and resist it. I know I am speaking in the presence of those who claim to represent the sentiments of the workingmen, but the rank and file of these organizations do not understand that this is a bill to prevent overtime, and when they do they will be against it to a man."

W. D. Forbes, president of the W. D. Forbes Co., of Hoboken, manufacturer of auxiliary engines, and Harold Lomas, Washington, representative of the Crocker-Wheeler Co., of Ampere, N. J., manufacturer of electrical motors and dynamos, also spoke against the bill. The committee adjourned until March 10.

NEW YORK FEDERATION OF EMPLOYERS.

New York is to have a central federation of employers similar to the Central Federated Union. This was decided on a few days ago at an informal dinner of secretaries of the various employers' associations. William K. Fertig, secretary of the Building Trades Employers' Association, presided at the dinner, and Henry C. Hunter, secretary of the New York Metal Trades Association, was toastmaster. The largest individual organization represented was the Building Trades Employers' Association, itself a central body with about 100 subordinate associations affiliated. Messrs. Fertig and Hunter were appointed as a committee to draw up a plan of organization to be submitted to a meeting to be called within two weeks.

AN IMPORTANT OHIO LABOR DECISION.

In the case of the State of Ohio vs. D. Spencer Brookman, in which it was decided by the Ohio supreme court, as noted in these columns last week, that the Ohio law making it a crime for an employer to discharge a man because he is a member of a labor union is unconstitutional, there will be no syllabus or opinion writen by the court. The decision reads: "Exceptions overruled on authority of Railway Co. vs. Schaffer, 65 Ohio St., 414, and of Cleveland v. Construction Co., 67 Ohio St., 197." The court simply overruled the exceptions of the prosecuting attorney of Columbiana county, who excepted to the ruling of the judge of the common pleas court of that county, in sustaining the demurrer to the indictment. The case grew out of the Amalgamated Association of Iron, Steel and Tin Workers' strike of two years ago. D. Spencer Brookman, of Wellsville, superintendent of the mills of the American Sheet Steel Co., discharged Leonard Schaefer and was later indicted under the section named. A demurrer was filed and the constitutionality of the law attacked. The common pleas court sustained the demurrer. The prosecuting attorney carried the case to the supreme court.

NATIONAL METAL TRADES ASSOCIATION.

The following well known manufacturers have been elected to serve on the district committees of the N. M. T. A. for the ensuing year:

SECOND DISTRICT.

A. W. Whitcomb, chairman, Whitcomb Mfg. Co., Worcester, Mass.

H. D. Beach, vice chairman, Pacific Iron Works, Bridgeport, Conn.

F. H. Strong, Eaton Cole & Burnham Co, Bridgeport, Conn.

G. T. Brown, Brown Cotton Gin Co., New London, Conn.

C. E. Hildreth, P. Blaisdell & Co., Worcester, Mass.

THIRD DISTRICT.

F. H. Stillman, chairman, Watson-Stillman Co., New York.

F. A. Sheffler, vice chairman, Marine Eng. & Machine Co., Harrison, N. J.

M. K. Bowman, Jas. Reilly Repair & Supply Co., New York.

A. B. See, A. B. See Electric Elevator Co., Brooklyn, N. Y.

James Eastwood, Benj. Eastwood Co., Paterson, N. J.

FOURTH DISTRICT.

W. Grant King, chairman, Iroquois Iron Works, Buffalo, N. Y.

H. H. Franklin, vice chairman, H. H. Franklin Mfg. Co., Syracuse, N. Y.

M. D. Knowlton, Knowlton & Beach, Rochester, N. Y.

F. W. Haskell, Carborundum Co., Niagara Falls, N. Y.

W. B. Morrison, McIntosh, Seymour & Co., Auburn, N. Y.

EIGHTH DISTRICT.

J. Kirby Jr., chairman, Dayton Mfg. Co., Dayton, O.

Frank I. Joyce, vice chairman, Joyce-Cridland Co., Dayton, O.

R. H. Jeffrey, Jeffrey Mfg. Co., Columbus, O.

D. B. Kirk, C. & G. Cooper Co., Mt. Vernon, O.

TENTH DISTRICT.

H. M. Leland, chairman, Leland & Faulconer Mfg. Co., Detroit, Mich.

E. F. Lloyd, Lloyd Construction Co., Detroit, Mich.

E. T. Gilbert, Michigan Bolt & Nut Works, Detroit, Mich.

E. D. Church, Jackson & Church Co., Saginaw, Mich.

F. T. Ducharme, Ireland & Matthews Mfg. Co., Detroit, Mich.

TWELFTH DISTRICT.

F. S. North, chairman, Union Special Sewing Machine Co., Chicago.

W. P. Eagan, vice chairman, F. W. Wolf Co., Chicago.

R. W. Young, Weir & Craig Mfg. Co., Chicago.

T. A. Jones, W. A. Jones Foundry & Machine Co., Chicago.

H. H. Latham, Latham Machinery Co., Chicago.

FIFTEENTH DISTRICT.

E. J. Kimball, chairman, Globe Iron Works, Minneapolis, Minn.

C. A. Luster, vice chairman, Clyde Iron Works, Duluth, Minn.

C. S. Yarnell, Moore Carving Machine Co., Minneapolis, Minn.

J. L. Record, Minneapolis Steel & Machinery Co., Minneapolis, Minn.

O. B. Kinnard, Kinnard-Haines Co., Minneapolis, Minn.

Commissioner DuBrul leaves for Memphis on March 7, to organize a local metal trades association in that city.

The Cincinnati members are making arrangements for a private car to go to the Philadelphia convention.

The Philadelphia members are arranging an informal smoker for their fellow-members to be held on the evening of March 23 at the Hotel Walton.

Hugh Kelly has been appointed secretary of the Manufacturers' and Employers' Association, of Trenton, N. J.

Fred H. Holz Jr., of the Cincinnati Milling Machine Co., went to St. Louis this week to be the guest of the St. Louis Metal Trades Association at their smoker on Wednesday evening, March 9.

LABOR NOTES.

The boilermakers on the entire Pacific Coast system of the Southern Pacific railroad have gone on a strike as a result of the long-standing controversy regarding a general advance in wages. About 500 men have quit work.

The Ashland Coal & Iron Mining Co., Ashland, Ky., has reduced wages in all departments to the same as paid previous to the last advance, which took place April 1, 1903. The reason given for the cut in wages is stated by the company to be dullness of the iron market.

For the second time within a year the Appellate court of Illinois has declared that picketing by strikers is illegal. The court has affirmed an injunctional order against the Iron Molders' Union issued by Judge Jesse A. Holdom on appeal for relief by the Illinois Malleable Iron Co. In its petition for injunction the Illinois Malleable Iron Co. declared it had $500,000 invested in its plant and employed between 600 and 700 men. It was set forth that the union called a strike at the company's plant and that its members were intimidating 110 molders of the company's force who were willing to continue at work.

The strike of the Dunbar Furnace Co., Dunbar, Pa., has been settled and the men have returned to work. The strike was over a reduction of five cents a day in the men's wages. The terms of the settlement were not announced.

About 100 employes of the American Steel & Wire Co., Donora, Pa., quit work a few days ago in consequence of a reduction in wages.

The boilermakers of the Fulton Iron Works, San Francisco, have obtained an increase of wages from $3.15 to $3.60 a day.

An officer of the New Haven Iron & Steel Co., New Haven, Conn., which was closed down for about a month, states that the company is now running full handed. The shut-down was owing to a labor dispute between employes, and not between employes and the management.

The strike of the boilermakers at the American Locomotive Works at Scranton, Pa., is ended. Mr. Fox, the national organizer of the boilermakers' union, rendered valuable assistance in adjusting the trouble. The terms of the settlement are not announced.

About 200 iron workers, who after a strike returned to work at the Western Steel Car Foundry Co.'s plant at Hegewisch, Ill., about two weeks ago, are again on strike claiming that the company is violating its agreement. The piece work system is the cause of the controversy.

The machinists employed in the Youngstown, O., district refuse to accept the recent reduction in wages and before a strike is declared will meet with their employers for the purpose of adjusting matters.

The strike at the plant of the Parkersburg Iron & Steel Co., Parkersburg, W. Va., which was started by the Amalgamated Association of Iron, Steel and Tin Workers, some time ago, has been practically broken, the majority of the former employes having applied for work at the reduction offered them before the strike was declared.

Owing to the discharge of 16 union structural iron workers at the Ambridge plant of the American Bridge Co., a strike that not only will tie up this plant but the entire Pittsburg district, is threatened. The places of the discharged union men have been filled by non-unionists. The company has been given until April 1 to give a satisfactory answer.

A TRADE JOURNAL FOR PATTERNMAKERS.

The issue of March, 1904, is Vol. 1, No. 1, of the *Patternmaker*, a new monthly journal published by the Iron & Steel Press Co., of Cleveland. The *Patternmaker* is magazine size and in subject matter and typography the March number is exceedingly creditable. The pattern shop, in view, possibly, of its close relation to the machine shop and the foundry, has not been represented until now by a journal devoted especially to its practice and processes, and therefore the *Patternmaker* comes to occupy a place long unfilled. The initial number contains 84 pages of reading matter and advertisements and the front cover page is of an attractive design, one feature of which is a pattern shop interior view. The leading article is a description of the pattern shop and pattern storage arrangements at the West Allis, Wis., plant of the Allis-Chalmers Co. Titles of some of the other articles are: "A Pattern Record," "Standard Classification of Patterns," "Wood for Patterns," "System in Making Large Patterns," "Propeller Wheel Patterns," "Anatomy of a Large Pattern," the "Patternmaker and Machine Designer," "Lags" and "Stripping Plates." To judge from this first number the *Patternmaker* will be of great service to the interests it has set out to represent, and should find a good response from foremen patternmakers, the ambitious men in the shops, proprietors and all interested in pattern shop equipment and supplies. The subscription price is $1 a year.

Traffic Club of Pittsburg.

The second annual banquet of the Traffic Club of Pittsburg, was held at Pittsburg, on Friday evening, March 4, at the Hotel Schenley. The banquet was attended not only by railroad traffic managers from all parts of the country, but a large number of steel manufacturers were in attendance, and it was one of the most notable affairs of this kind ever held. Gen. H. P. Bope, second vice president of the Carnegie Steel Co., spoke on "Pittsburg—A City Without a Commercial Rival." He said that Pittsburg's freight was greater than that of New York and Chicago combined and that in 1902 its tonnage was twice as great as that of the port of London, four times as great as that of Paris and greater than the combined tonnages of New York, Boston, Baltimore and Chicago. In plain figures it amounted to 88,000,000 tons. He said that while the congestion in 1902 was considered serious, it is worse today, and if the mills were as busy now as they were then the railroads could not begin to handle the freight. Earlier in the day a special train carried the visiting railroad officials on a tour of inspection over the various terminals in the Pittsburg district and souvenir maps of industrial Pittsburg issued as a supplement to *The Iron Trade Review* on Nov. 6, 1902, were distributed by the Traffic Club and highly prized.

It has been reported this week, but without special confirmation, that B. H. Warren of Pittsburg, formerly vice president of the Westinghouse Electric & Mfg. Co., will succeed Chas. Allis as president of the Allis-Chalmers Co.

The Toledo Machine & Tool Co., of Toledo, O., has just made a shipment of several car loads of machinery to Southeastern Ohio. This company has a large amount of machinery under construction at present, some of it on entirely new lines.

The directors of the Fort Wayne Iron & Steel Co., whose plant was started on Dec. 22 last, held a meeting a few days ago and received reports showing that 2,210 tons of iron had been worked since the plant began operation. It was stated that the company has orders on hand for 8,000 tons.

E. D. Rogers, for a number of years connected with the sales department of the Republic Iron & Steel Co., and more recently manager of sales of the Bassett-Presley Co., Cleveland, has organized the E. D. Rogers Co., which will deal in iron and steel. The company will have its offices in the Garfield building, Cleveland.

The Atlantic furnace of the Republic Iron & Steel Co. will resume operations in a few days. This stack is located at New Castle, Pa., and has undergone extensive repairs in the past few months.

The steel plant of the National Tube Co., at Lorain, O. resumed operations March 7.

A DINNER TO PRESIDENT WM. B. SCHILLER.

In an elaborate dinner given at the Hollenden, Cleveland, on the evening of Tuesday, March 8, in honor of William Bacon Schiller, president of the National Tube Co., the Chamber of Commerce of Lorain, O., voiced its appreciation of the great work which the tube company is doing in erecting its new plant. The event was indeed a hearty expression from the enterprising people of prosperous Lorain. It was complete in its appointments and was thoroughly enjoyed by all in attendance. About 100 members of the Lorain Chamber of Commerce, most of them accompanied by ladies, went to Cleveland to attend the dinner, and among their guests present were President W. B. Schiller and Vice Presidents Culbertson and Allderdice, of the National Tube Co., and M. M. Suppes, general manager of the National Tube Co.'s Lorain plant. Letters of regret were read from a number of those invited, including L. C. Hanna, and Samuel Mather, of Cleveland, and Daniel Coolidge, of Philadelphia.

William A. Donaldson, president of the Lorain Chamber of Commerce, acted as toastmaster and introduced the speakers of the evening with grace and pith. Mr. Schiller responded to the toast "Relations of the Manufacturer to the Community." He spoke extemporaneously but with ease and much earnestness. He said in part:

"In the relations of the manufacturer to the community there

WILLIAM B. SCHILLER.

is no problem so complex, there is no condition so fraught with danger, that if approached in the spirit of 'play fair' it cannot be solved. A favorite slogan of a great man of this community who has recently passed away was expressed by the plain, homely words, 'Stand pat.' In speaking of the relations of the manufacturer to the community, I would use the equally plain and perhaps no less significant words, 'Play fair.' It has been most gratifying to the representatives of our company that this spirit of fair play has governed the people of Lorain in all their relations with it.

"It may perhaps be expected that I give some description of the new work that is now being done at Lorain. We are building two blast furnaces of greater capacity than those now in operation. New ore docks will be completed with modern machinery for the best modern service. The skelp or rolling mills are four in number, most modern in their equipment and will have a capacity of 1,200 tons daily. In the welding furnces all sizes of pipe from ⅛ of an inch to 20 inches will be made, and the capacity will be 1,000 tons daily. This product will go to all parts of the earth and will make the name of Lorain as widely and favorably known as that of Pittsburg. All engineering problems connected with the new plant have been solved, contracts awarded and a part of the plant will be in operation next August, although the new construction will not be finished in its entirety until next year. No effort will be spared in pushing the construction to completion, and the plant will be finished as planned. The fact that the roofing area will be 25 acres may give some idea of the size of the buildings."

In conclusion, Mr. Schiller spoke of the importance of the people of Lorain furnishing houses for the army of workmen who will soon be engaged at the new plant. He gracefully expressed his thanks for the honor that had been paid him and the pleasure which he had in meeting the representative citizens of Lorain and their guests.

The other speakers of the evening responded to toasts as follows: "Captains of Industry," A. I. Findley, editor *The Iron Trade Review*; "The Industrial Outlook," Col. J. J. Sullivan, president Cleveland Chamber of Commerce; "After Dinner Speeches," W. L. Hughes, Lorain; "The People of Lorain," Hon. F. J. King, Lorain, and "The Ladies," F. A. Smythe, of the Thew Automatic Shovel Co., Lorain.

A pleasant feature of the evening which was not on the official program was the address by F. A. Rowley, a member of the Lorain Chamber of Commerce, who spoke in terms of highest praise of Daniel Coolidge, formerly president of the Lorain Steel Co., of Ohio, who for a number of years resided in Lorain and has recently gone to Philadelphia, where offices of the Lorain Steel Co. of Pennsylvania are located. Unfortunately, Mr. Coolidge was not able to be present to receive a handsome silver plate which the people of Lorain will present to him. The plate was referred to by Mr. Rowley, who in conclusion read the following testimonial recently adopted by the Lorain Chamber of Commerce:

"Recognizing and fully appreciating the immense benefits the city of Lorain has derived from the broad-gauge policy which has characterized the management of the Lorain Steel Co. in the past, and in testimony of a public obligation which the city of Lorain owes to Mr. Daniel Coolidge for his conspicuous part in all matters mutually affecting the interests of the Lorain Steel Co. and the city of Lorain, this letter has been authorized by the directors of the Chamber of Commerce of Lorain.

"It is with sincere regret that our citizens part with Mr. Coolidge. It is the earnest hope of the people of Lorain that he may enjoy God's richest blessings of health and happiness in his new home."

The Tube Company's New Plant.

Ground was broken for the National Tube Co.'s new plant at Lorain in June, 1903. Contracts were awarded to the Oscar Daniels Co., of Chicago, for thirty-eight jobs. These included the steel construction of the tube mills, the two new blast furnaces, and additions and improvements to the old mills. The contracts taken by this company aggregated 15,000 tons of structural steel.

Blast furnaces Nos. 1 and 2 have been running four years. The work of construction on the new furnaces, Nos. 3 and 4, is so far advanced that they will probably be ready to be blown in by July.

The skelp mill group consists of four mills each, 80 x 746 feet. Nearest to completion is the skelp mill heating furnace building. The steel work on these buildings is well advanced.

A short distance from the skelp mills are the lap weld mills. There are four of these. Nos. 1, 2 and 3 are 679 feet long by 98 feet wide. No. 4 is 725 feet long. Near by is the machine shop, 300 feet long. Next to the lap weld mills is the group of butt weld mills, five in number.

There will be erected by March 1 of next year, when the contract stipulates they shall be finished, thirty-eight new steel buildings. The total cost will be $8,000,000. There will be 6,000 men employed in the tube mills, and these together with the 3,500 employed in the steel plant and blast furnaces will make an aggregate of 9,500 employes. The company will be the largest single employer of labor in the state.

At a meeting of the recently appointed committee of unsecured creditors of the Stilwell-Bierce & Smith-Vaile Co., of Dayton, O., held in that city Feb. 24, the following were recommended for appointment as trutees: W. S. Rowe, cashier of the First National Bank of Cincinnati; W. H. Davis, president of the Central Trust & Safe Deposit Co., of Cincinnati; H. E. Talbot, formerly manager and now receiver of the Dayton company. The creditors' committee represents unsecured claims to the amount of $212,000 and 210 out of 260 claims filed.

LAKE SUPERIOR IRON MINES.

M. L. Fay and W. C. Yawkey, who have been exploring with diamond drill and hand work in the vicinity of the old Taylor mine, Baraga county, Mich., have stopped work. Their drill has been taken by the Bessemer Iron Co., which is exploring adjoining lands, and the latter is now operating two machines upon part of its holdings, with excellent success, so it is stated. One of these drills has cut more than 150 feet of ore, averaging about 50 percent iron and .050 phosphorus, and is still in ore. The other should be in ore very soon. A number of men is at work testpitting the company's lands. This company has several tracts under option for purchase and has in all its control not far from 100,000 acres in that part of Baraga county. It is possible that the Fay work will recommence in a week or two. This is on the western extremity of the Marquette range, close to the old village of L'Anse.

The Interstate Iron Co., operating the Lincoln mine, has put on a larger force than has been employed all winter and will add men until a full force is at work at both A and B shafts. It closed Dec. 1. The mine will not produce as much ore as it is capable of, but will make an output this year of from 300,000 to 350,000 tons. Machinery for a fine electric haulage plant is on the ground and will be installed at once. The mine has two shafts and is excellently equipped underground and on surface. It produces a high grade of Bessemer ore and contains a large tonnage. It is the property of Jones & Laughlin, with Capt. Thos. Walters in general charge and Mr. C. T. Fairburn as manager. The company's Grant mines will not be operated this year.

The Oliver Iron Mining Co. is operating only six of its mines in the Hibbing group this winter, these being the Day and Sellers, St. Clair, Glen, Clark and Chisholm. It is opening in the same district the Monroe and Howard and is exploring the Burt in preparation for extending the stripping undertaken a year ago.

Pickands, Mather & Co. are to reopen their Malta mine at the village of Sparta and a very much larger shipment than in 1903 will be made this season. About 100 men will be employed within a month. The Malta has been absolutely idle since last June.

Stripping operations at Morris mine, of the Oliver Iron Mining Co., which were commenced last year under a contract that would run over several seasons, will not be continued this year, and two shovels that have been in the mine are being moved to the Fayal, where the same contractors have a very large contract for the same company. The Fayal stripping will be pushed forward faster than anticipated and three or four shovels will be employed in the work this year, commencing very soon. The Drake & Stratton Co., which has this contract, will operate eight shovels this year, at the Fayal, Leonard and Stevenson mines. The company's machine shops are now busy overhauling shovels and locomotives for the campaign.

Work is to resume at Albany mine, Hibbing district, in about ten days. It is a shipper to the Lackawanna Steel Co.

The Republic Iron & Steel Co., which is operating several mines on the Mesabi range this winter, is hoisting more ore than usual, and will have large stocks at the opening of navigation. It carried over much ore from last year also. The company has about 175,000 tons in stock on surface at its three operating properties at Virginia, of which 112,000 was left on hand at the close of navigation. Its Kinney is to reopen as soon as open pit mines can operate successfully. Its Wills will not mine anything this year.

The White Iron Lake Iron Co., which is operating a drill on the shores of the lake of that name, south of Ely, is getting a lot of magnetic ore, and samples from the drill look very good. The company claims to have more than 60 feet of this ore. A hole is to be sunk 1,400 feet, so they say. Adjoining lands that are now being prospected show magnetic ore more or less clean, and it may be that there will be some activity in that section the coming season. Any quantity of magnetite can be found all through there, both as float and in place, but the large companies have not considered the location with especial favor and do not think the formation is deep, but thin and flat.

An island in Snowbank lake, just opened for settlement, has been filed upon by a Duluth land man, who will carry on explorations for iron. The lake is in T 64 R 9, and is on the eastern Vermillion range, about 20 miles from Ely, Minn.

The Michigan Consolidated Iron Co., recently incorporated under the laws of Ontario with an authorized capital of $1,000,000, has property in Canada in which it states it has found a fine grade of Bessemer ore. The plans are not yet perfected. The company states that work will begin as soon as snow is off the ground and a crusher will be built and, possibly, a smelter.

Corrigan, McKinney & Co., have closed their Jordan mine for an indefinite period. The pumps have been withdrawn. The Commodore mine of this company has been closed and apparently will remain so during the coming season. The property is in good condition for resumption at any time.

Allis-Chalmers Co. Absorbs Bullock Co.

Simultaneous announcement was made at Milwaukee, March 5, by the officials of the Allis-Chalmers Co., of the resignation of Charles Allis as president of the company and of the corporation's consolidation with the Bullock Electric Mfg. Co., of Cincinnati, O., the third largest electrical manufacturing plant in the country. The continued illness of Mrs. Allis, necessitating an extended trip abroad, is assigned as the cause of Mr. Allis's resignation. The successor of Mr. Allis has not been announced.

Joseph S. Neave, vice president of the Bullock Electric Mfg. Co., made the following statement:

"The present Bullock Electric Mfg. Co. will remain intact. The same officers will be continued, and also the same board of directors. The company is incorporated according to the laws of New Jersey. There will be another Bullock Electric Mfg. Co. formed acording to the laws of Ohio. This will be the leasing company of the plant, and this company will run the Bullock plant as it is run at the present time. In fact, the Bullock Electric Mfg. Co. and the Allis-Chalmers plants will be run as if they were one concern. The Allis-Chalmers Co. guarantees to pay the 6 percent dividend on the preferred stock of the Bullock company. It also agrees to pay 6 percent on the common stock of the old Bullock Electric Mfg. Co. for all the assets of the Bullock Electric Co. that are over and above the valuation of the preferred stock.

"As a result of this deal with the Allis-Chalmers Co. the present capacity of the Bullock electrical works is to be enlarged. The first thing that will be done will be to erect another large shop, with an area of 40,000 square feet, where motors for street cars will be manufactured. This will mean the employment of about 400 more hands. It is the intention of the new leasing company to enter actively into the street car equipment field. The lease is for 25 years with the privilege of renewal for another 25 years on the same terms. It is my opinion that when the plans that are now under way have been completed the Bullock electrical works will give employment to from 2,000 to 3,000 hands.

"While the papers have been signed the deal will not go legally into effect until after the stockholders of the present Bullock Electric Co. have had their special meeting at Jersey City on Wednesday, March 16."

The navy department will make an early and thorough investigation of the cost of producing armor plate in European countries, and has ordered Rear Admiral Charles O'Neil, chief of ordnance, to proceed abroad and make such investigation. The Midvale Steel Co., of Philadelphia, has already made some armor plate which has stood the chemical test of the company's experts, and the company believes that the plates will withstand the battering from the testing guns on the government proving grounds. The company will not, however, ask for the testing until it is in position to turn out armor in large quantities. Work on the new plant of this company has progressed slowly, but the officers hope that by early summer it will be in full operation.

The Nickel Plate railroad has recently placed an order with the Brooks Locomotive Works, Dunkirk, N. Y., for five freight engines and five yard engines for use on the Buffalo division.

The Foundrymen's Association.

The 136th monthly meeting of the Foundrymen's Association, was held at the Manufacturer's Club in Philadelphia on Wednesday evening, March 2, the president, Thomas Devlin, occupying the chair. Among those present were the following:

Thos. Devlin, Thos. Devlin Mfg. Co.
Geo. S. Deal and John K. Still, Standard Scale & Supply Co.
Chas. Orr, Thomas-Roberts-Stevenson Co.
N. D. Powell, Baldt Anchor Co., Chester, Pa.
E. E. Brown, E. E. Brown & Co.
A. H. Blackburn, Green Fuel Economizer Co., Matteawan, N. Y.
T. B. Harkins, T. B. Harkins Foundry Co., Bristol, Pa.
Philip C. Smith, Ingersoll-Sergeant Drill Co., Easton, Pa.
A. G. Warren, J. W. Paxson Co.
Walter B. Kennedy, Bethlehem Steel Co.
Thos. J. Kelly, Thomas-Roberts-Stevenson Co.
W. A. Perrine, Abram Cox Stove Co.
J. S. Robeson, American Glutrose Co., Camden, N. J.
W. H. Ridgway, Craig Ridgway & Son Co., Coatesville, Pa.
H. L. Haldeman, Pulaski Iron Co.
Geo. C. Davis, Chemist.
A. A. Miller, *Iron Age*.
W. O. Steele, Bateman Mfg. Co., Grenloch, N. J.
H. O. Evans, Thos. Devlin Mfg. Co.
J. J. McCrystal, Wm. Sellers & Co.
C. R. Brown and A. D. Wallace, E. E. Brown & Co.
W. H. Hunt, Wm. Adams Foundry Co.
F. Cooper Pullman, J. Wesley Pullman.
Walter S. Bickley, Penn Steel Casting & Mach. Co., Chester, Pa.
O. J. Ward, Howe Scale Co.
Chas. F. Link, Thos. Devlin Mfg. Co.
H. L. Tripple, Fairbanks Co.
Lyman P. Clark, Abram Cox Stove Co.
Frank T. Wright, U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J.
J. H. Pepper, *The Iron Trade Review*.
Thos. Holt, Camden Foundry Co., Camden, N. J.
Frank Etting, E. J. Etting Co.
J. S. McCormick, J. S. McCormick Co., Pittsburg.
W. G. Magoffin, Atlantic Dryer Varnish Co.
P. J. Potter, E. J. Etting Co.
Ed. H. Frohman, S. Obermayer Co., Cincinnati.
E. Marks and J. Thompson, J. Thompson & Co.
Wm. J. Shennan, Bethlehem Steel Co., S. Bethlehem, Pa.
Chas. Kessell and Earl Goebert, Williamson Bros.
Harry Hüder and Chas. Muir, Schaum & Uhlinger.
Howard Evans, J. W. Paxson Co.

The treasurer reported a balance of over $2,000 in the treasury, and all bills paid.

The secretary read a communication from Dr. J. A. Holmes, chief of the Department of Mines and Metallurgy, St. Louis World's Fair, stating that the exposition authorities would erect the building necessary to contain the proposed model foundry exhibit. On motion E. E. Brown was elected to represent the association at the Exposition.

Fuel Economizer.

The paper of the evening was by A. H. Blackburn, of the Green Fuel Economizer Co., Matteawan, N. Y., on the "History and Advantages of Green's Fuel Economizer." We give some extracts below:

In the year 1845 the late Edward Green, of Wakefield, Eng., after two years of careful experiment, took out his first patent for a fuel economizer, Patent No. 10986, in the English Patent Office, which is practially the foundation upon which all subsequent economizer improvements are more or less based. It was not until after the first International Exhibition held in London in 1852, when the economizer was exhibited, that steam users in Europe recognized the great opportunity for saving that was thus placed within their reach. At the present day the invention is used by owners of boilers all over the globe and it is computed that it effects a saving of upwards of $7,000,000 per annum.

The first economizer erected in the United States was in the year 1867 by the late Thomas Sanders, of Providence, R. I. When on a trip to England he bought the economizer and imported it to this Bleach & Dye Works, at Providence. On a visit I paid his son, Mr. Thomas Sanders, at Sandersdale, R. I., in the year 1893, he informed me that when the machine arrived and he found his father had paid for it in gold, when gold was at a premium of 93 percent, he thought his father had made a great mistake, but after the machine was put up and working they were more than pleased with the extra amount of steam they could make with less fuel, and subsequently when they moved their location from Providence to Sanderdale, the economizer was the only piece of steam plant that they moved. This economizer was in service from 1867 to 1893, when it was replaced by a new machine. The same company also bought one of the Green economizers that was exhibited at the Centennial Exhibition in 1876, which also has recently been replaced by the duplicate economizer.

Two Green economizers were exhibited at the Philadelphia Centennial Exposition in 1876, one in actual operation and one in Machinery Hall. The manufacturers of New England, where coal is high, and the sugar refiners of Philadelphia and New York, were the first to recognize the merits of the apparatus. At that time in this country, and until within the last fifteen years, the margin of profits was so much larger than it is today that a manufacturer did not pay very much attention to economies in his boiler house. As long as he obtained sufficient steam to drive his machinery, the cost of his coal bill did not cut very much figure in his dividends. This has all changed in these days of keen competition and the manufacturer is looking as carefully for savings in his steam plant as he is in his machine tools, his looms or his rolling mills.

The object of the economizer is to save fuel, which it accomplishes by utilizing the heat in the waste gases leaving the boilers before they enter the chimney, for heating feed water for boilers or hot water for manufacturing purposes. In order to use as much as possible of the heat in the gases of combustion, a steam boiler is provided with more or less heating surface and as the hot gases pass over the surface this heat is gradually abstracted from them for the reason that the surfaces of the boiler are cooler than the gases. The rate at which these gases give up their heat depends on the difference of temperature between the gases and the water. The temperature of water in a boiler is very near the temperature of steam corresponding to its pressure, and therefore when the temperature of the gases by the absorption of the heat begins to approach the temperature of the steam, the absorption becomes very slow and a large extension of heating surface only produces a slight cooling effect on the gases. At this point the first cost of adding heating surface to the boiler is not counterbalanced by increased evaporation. In boiler practice today the escaping gases will average from 450 to 550 degrees Fahr., and as it is impracticable to use this heat by extending the heating surface in the boiler, by applying an economizer and passing the cool feed water through it the lower temperature gases can be economically utilized.

The advantages of an economizer are: 1. The saving of fuel. On a modern up-to-date steam power plant a saving of 10 percent in fuel can be made, and in many cases, under everyday working conditions, considerably more. 2. The steaming capacity of your boilers is increasing. 3. You always have a large volume of water above boiling point to take care of sudden demands for power when your heavy load comes on, thereby enabling your firemen to keep an even pressure of steam. 4. It prolongs the life of your boilers by the high temperature feed water, preventing expansion and contraction. 5. It purifies the feed water by depositing sediment in the apparatus (where it can be easily blown off), by reason of slow circulation and high temperature, keeping the surfaces of your boilers much cleaner. 6. In large boiler plants, especially in large cities where labor is high, you save in labor the handling of 10 percent extra coal and ash, which in a year's time amounts to quite an item.

New applications for the use of the economizer are being developed every year in the utilization of waste heat apart from the original one of saving heat from the waste gases from boilers. At the plant of the Rome Brass & Copper Co., at Rome, N. Y., the economizers are being used for reclaiming the heat going to waste from the re-heating furnaces. The gases from the furnaces, instead of being taken out of short independent stacks from each furnace, are carried into a main flue taking the gases from all the furnaces through the economizer to a single stack, and are heating water from 100 degrees up to 300 degrees Fahr.

At the Pennsylvania Steel Works at Steelton, Pa., the gases from the blast furnaces, after passing the boilers, are carried

through an economizer and with the automatic scrapers in use on the tubes there has been no trouble in keeping the tubes clean.

The economizer is also being used for utilizing the waste heat from rotary cement kilns. In one of the large department stores in Philadelphia an economizer has been working successfully for some time, utilizing the waste heat from a Morse refuse destructor, and economizers have been extensively used in connection with garbage destructors in Europe. In quite a number of the oil refineries of the Standard Oil Co., economizers are used for utilizing the heat from the oil stills and have proved a very profitable investment. In bleacheries and dye works and other manufactories using large quantities of hot water, the economizer is placed behind the boilers and the hot water utilized in the manufacturing process, giving very considerable economy, where live steam has previously been used. In several of the large hospitals and laundries in the States and Canada, the economizer is furnishing the hot water for washing purposes.

A very economical way for heating mills and factories by the hot water system is to use the economizer for heating the water. The water is pumped through the economizer into the heating system and returned again to the economizer. In passing through the system the water will lose about 20 degrees Fahr. The water will return to the economizer from 160 to 170 degrees and leave from 190 to 200 degrees Fahr.

In the process of making water gas, the operation is an alternating one. Steam is blown through for ten minutes and gas is made. Then it is necessary to shut the steam off and blow air through the generator carbureter and superheater and into the open air to heat them up again for ten minutes; then the air is shut off and steam turned on again and gas made for another ten minutes, and so on alternately. During the process of blowing through, a great deal of heat is lost, a large portion of which can be reclaimed by putting it through an economizer. It was feared at first that gas might accumulate in the economizer and cause an explosion; but if the pilot lights at the stack valve are kept burning there is no risk at all. Thus using an economizer, heating the water for the boilers, the water is heated up to a temperature corresponding to the temperature of the steam in the boilers, usually about 350 degrees Fahr. In addition sufficient water can be heated to heat the water in the water seals of the gas tanks in the winter time to prevent their freezing.

In the smelting of ores there is quite a percentage of valuable metal carried away in the fumes passing away up the stack and long flues have been designed to cool off the gases and deposit this metal in the bottom of the flues where it is carefully collected and reclaimed. This can be done far more efficiently by installing an economizer and passing a large volume of water through to cool the gases, when they will deposit the valuable metal in the chamber under the economizer.

Records show that the average life of a well-built economizer is from 15 to 20 years with ordinary care and attention, and therefore it is a conservative basis to allow a 6 percent depreciation. From records of a number of large plants, the cost of maintenance and repairs has not exceeded 1 percent.

The value of an economizer varies in proportion to the cost of fuel and the heating value of that fuel, and the cost of installation varies according to designs and conditions of each particular plant. Taking the average manufacturing plant and estimating a saving of 10 percent in the total fuel consumed during the year, working 300 days during the year and 10 hours per day, the economizer will show the following gross returns on the investment:

With coal at $5.00 a net ton	48.7 percent
With coal at 4.00 a net ton	38.5 percent
With coal at 3.50 a net ton	33.7 percent
With coal at 3.00 a net ton	28.9 percent
With coal at 2.50 a net ton	24 percent
With coal at 2.00 a net ton	19.2 percent

Subtracting from this gross return per annum on the investment, cost of depreciation, maintenance and repairs, with coal at cost of $2 per ton delivered in your boiler house, the economizer pays a good return on your investment. If you work 20 hours out of the 24 as a number of manufacturing plants do, your return doubles up. This estimate only takes into consideration the saving of fuel, to which should justly be added gain from the other advantages mentioned in the first part of this paper. In the above estimate I have only considered the average boiler plant, taking a conservative estimate of 10 percent saving, but where hot furnace and other gases are available a much larger saving is being made.

The economizer consists of a series of cast iron tubes, usually about 9 feet in length by 4 9-16 inches external diameter, arranged in sections of various width. The sections are formed by forcing the tubes stimultaneously into top and bottom headers by means of hydraulic presses. The ends of the tubes are accurately turned to gauges and the headers are bored out and reamed to standard measurements, forming a perfect metal to metal point when pressed together. The sections are joined together by branch pipes or manifolds running lengthwise, one at the top and one at the bottom on opposite sides, the branch pipes being outside the brickwork which encloses the apparatus. Each tube is encircled by a set of triple, overlapping scrapers with bevel cutting edges, the lugs of which rest on lifting bars. These travel up and down the tubes at slow rates of speed, the object being to keep the external surface free from soot. The soot drops down into the soot chamber between the sections, where it is periodically cleaned out. The mechanism for working the scrapers is fixed on the top of the economizer, outside the chamber, and is driven from a countershaft or small independent engine or motor. Over each tube is placed a hand hole lid for cleaning out, and on the connecting branch pipe are also lids to clean out the headers, making all the internal surfaces accessible for the outside. The hand hole lids are all accurately turned to standard gauge and the headers reamed to match, making metal to metal joints.

On a great many economizers now being erected in place of using brick walls to enclose the chamber, a sectional sheet iron covering is used, lined with two or more inches of magnesia and asbestos nonconducting material, which very much facilitates cleaning out and also saves considerable infiltration of air which takes place in ordinary brickwork.

Economizers have to stand the same pressure as boilers, as the feed water is pumped direct through the economizer into the boilers and are now being built for pressure up to 250 and 300 lb. per square inch.

At the conclusion of the reading a unanimous vote of thanks was passed to Mr. Blackburn. There was no discussion on the paper.

Moisture in Molding Sand.

The "Quiz" class presented for discussion the question "What amount of moisture is there in molding sand when properly prepared for use?"

Secretary Evans—This is not a new subject. I do not see why a basis should not be obtained for delivery of sand. We find a similar proposition when dealing with concrete. As regards the struck bushel, you wet down a heap of sand and it grows smaller. I do not see why the basis of a cubic foot should not do in any kind of weather. In a cubic yard of fine molding sand you could put in a good deal of water and there will be no more space taken up than before. A basis of a ton for so many feet would, it seems to me, be fair.

Mr. Devlin—The question is as to sand for use, not delivery. It makes some difference what kind of sand is referred to. It would seem that no rule could be made.

Mr. Harkins—In my judgment the molder using the sand would be a factor.

Mr. Blackburn—It would seem hard to make a rule that would hold good in every case. The success of a molder is very largely in the tempering of the sand. A great many molders do not know how to temper sand, and have men to temper it for them.

Mr. Devlin—Is it not true that a molder tells by the feel of the sand whether there is enough moisture in it? If a man needs sand very badly and it comes to him in a bad condition, he certainly must dry it.

Secretary Evans—I can instance a firm who make very fine castings and who order their sand to be dug in August and September. They have a system of storage, but cannot store

enough for a very long winter on their own premises and go to the extent of securing outside storage. They are alive to the fact that it pays them to get molding sand in good condition if heavy rains have been frequent, or when frost is coming out of the ground.

The Time of Putting on Blast.

Another question presented was "How long should the wood fire in a cupola be lighted before the blast is put on?"

Mr. Harkins—I think the time should be long enough to get a good fire, then put in the iron and start the blast at the same time.

H. O. Evans—The iron should be put in when you see a red fire from the bed.

Mr. Smith—In my apprenticeship days it was the shop custom to work two or three days, until the shop was as full of work as possible. Our old foreman would then go to the cupola, put in his wood, coal, and iron, and load up to the charging door. He then would light the fire and put the blast on; and I never saw hotter iron than we then got. I know it is the custom in many foundries to light the fire and let it burn up until the coal gets cherry red, when it is supposed to be time to charge. Sometimes, however, it is found that the wood is wet and burns up slowly. Wait until the coal gets cherry red, seems to be the rule. We never found it necessary to wait a minute. We just lighted the fire and while it was burning up we put in the iron, turned on the blast and got as hot iron as at any time in my experience.

E. E. Brown—In our practice we have tried every scheme. Now, as soon as the fire shows through the coke we commence to charge and get better results than in any other way. It is only a few minutes before we put the iron in.

Mr. Kelly—In stove foundries the practice is to get the cupola ready, put the bed in, and light up about 10:30 or 11 o'clock; then let it burn until we see the fire coming through the bed, when we charge. It is frequently 2 o'clock before we put on the blast.

Mr. Hunt—We make our bed, and charge our iron up to the door. After lighting we let the fire run for about two hours before we put on the blast. Our iron comes down pretty hot.

Mr. Smith—I cannot see what is to be gained by waiting so long. You are certainly wasting the bed. I think the backbone of the heat is the bed.

Mr. Devlin—The wood is used for no other purpose than ignition of the coal.

Proper Blast Pressure.

A third question presented was, "What is the best way to determine the necessary pressure of blast for a cupola?"

Mr. Steel—I think the amount of air you are getting is more important to determine. It is important that the tuyeres be large enough and open enough to get a good volume of air. I have melted better with low pressure than with high pressure.

Mr. Haldeman—In blast furnace practice we find it necessary to know how many cubic feet of air we are using. Volume is very important, and it must also be so with the cupola.

Mr. Davis—Some years ago in watching operations in large cupolas I gave considerable attention to the pressure gauges in connection with a positive pressure blower. The pressure rose during the day, which showed that the tuyeres got more or less stuck up during the heat.

H. O. Evans—It is a question of volume entirely rather than pressure. You will find the pressure vary during a heat. I have never been able to get good results in our cupola under 14 to 16 ounces pressure.

Mr. Shennan—We have put in a new plant, with two cupolas. We have tried different tuyeres, pressures and volumes, and have certainly found that it is not volume alone that melts the metal. There must be some pressure back of it. The fuel used must also be taken into account. I have used 12 ounces pressure on one kind of coke, and found 9 ounces on another kind quite sufficient. The cupolas are large and I found many conditions depending on the stock. With coarse scrap, for instance, you can melt with less pressure.

Mr. Devlin—I agree with you that a good deal depends upon conditions. With strong pig iron and a lot of sprues mixed in you require more volume.

Mr. Shennan—Yes, and more pressure to get through the mass.

H. O. Evans—If you will study your melting zone you will be able to regulate your melting blast.

Mr. Brown—Our experience teaches us that pressures have nothing to do with the melting.

Mr. Shennan—It is proper combustion you want and you must have volume and pressure to get that. You may start out at 10 ounces and by the time you get near the end of the heat you will find your pressure gets up to 14 ounces.

Mr. Kelly—Our blowers are really air pumps, and we get volume with very little pressure. We start with about 8 ounces and gradually get up to 12 and 14 ounces.

The members, after adjournment, enjoyed a planked shad luncheon in the banquet room of the club. With speeches following, the hour was late before the members left for their homes.

THE UNITED STEEL CO.'S NEW PLANT.

The United Steel Co.'s plant at Canton, O., which has been in process of construction during the past 18 months will start in full operation about April 15. The company has an authorized capital of $500,000 divided into 1,000 shares with a par value of $500 each. Six hundred shares of stock have been taken by the incorporators, and 200 shares, which are to be used for working capital, are being sold to subscribers, leaving 200 shares of treasury stock. The board of directors consists of J. D. Carnahan, president; Joseph Biechele, vice president; Edward Langenbach, secretary; William Blecker, treasurer; W. W. Irwin and Charles Lang.

The estimated cost of the completed plant is $400,000. It will be equipped to produce billets, slabs, sheet bars, plates and universal plates. An arrangement has been effected with the Stark Rolling Mill Co. and the Carnahan Tin Plate Co., both of Canton, O., for their entire requirements of sheet bars, the total being about 38,000 tons per year.

The following are the dimensions of the various buildings: Open hearth building, 64 x 260 ft.; open-hearth lean-to, 32 x 260 ft.; open-hearth lean-to, 20 x 180 ft.; blooming mill building, 40 x 360 ft.; engine and electric power building, 35 x 80 ft.; boiler and pump equipment building, 45 x 80 ft.; gas producer building, 25 x 132 ft. These buildings are all iron clad, erected by the Ft. Pitt Bridge Co., of Pittsburg. The plant will be equipped with thoroughly modern machinery. The open-hearth building will contain three furnaces of 40-ton capacity each, also one 50-ton ladle crane, one 15-ton auxiliary crane, one 10-ton electric crane, a charging machine, soaking pits, etc.

The blooming mill building will contain a universal plate mill for the manufacture of slabs, billets, sheet bars and universal plates. The building will also contain straightening, transfer and cooling tables, run-out and tilting tables, blooming mill tables, manipulators, reversing engines, electric cranes and motors, plate and hydraulic shears, etc. The electric power building will contain a pair of 34 x 48 reversing bloom mill engines, manufactured by the Wm. Tod Co., also two 100-kilowatt direct connected dynamos. The gas producer building will contain 11 water seal producers of the Swindell type, placed in a depressed pit. Coal is carried to them over an elevated trestle track. The building containing the boiler and pump equipment will hold six Tudor vertical water tube boilers of 250 h. p. each, including boiler feed hydraulic and service pumps. The yard equipment will contain one mile of railway track, with the necessary cars and locomotive engine for handling scrap, pig iron, coal, etc.

The capacity of the rolling mill is more than double the present capacity of the open-hearth furnaces. The company estimates that by adding three or four more furnaces at an expenditure of $100,000, the production can be doubled. The plant has been laid out contemplating this extension.

Operations were resumed this week at the by-product coke oven plant of the Carnegie Steel Co., at Sharon, Pa. The recent floods damaged the ovens to a considerable extent, necessitating extensive repairs.

CENTENNIAL OF THE BLAST FURNACE IN OHIO.

The year 1904 is the centennial of the establishment of blast furnace industry in Ohio and that fact makes timely some reference to the earliest blast furnace in that State and to that portion of it which still stands at Poland, Mahoning county. Poland is a village of considerable historic interest. Not only was the late President McKinley educated there, but there also was the beginning of the great iron industry of the Mahoning Valley. Turhand Kirtland was a member of the surveying party that laid out a large part of the Western Reserve, including Poland Township, and largely from his diary and accounts we are able to present the facts given below:

Mr. Kirtland acted as agent for the Connecticut Land Co. and was one of the earliest settlers of Poland township. The draft of the township was made in 1798, and in 1803 he removed with his family to Poland.

In 1804 Daniel Eaton finished and began operating the first iron furnace in that section of the country. The work of construction had begun in 1803. This was the first furnace built in Ohio. The Connecticut Land Co. recognized the importance of this industry and the record states that in February, 1806, a bounty of $400 was paid to Mr. Eaton by the land company to encourage him in his work. The furnace was located along Yellow creek, about half way between the village of Poland and the Mahoning river. Along Yellow creek were rich deposits of kidney ore lying near the surface and this was the source of supply of ore. Charcoal was used for smelting

REMAINS OF OHIO'S FIRST BLAST FURNACE. BUILT IN 1804.

The capacity of the furnace was about two tons per day. The output was immediately cast into such articles as were in great demand among early settlers, such as stoves, kettles, skillets, sad irons, etc. Another entry in the land company's record is to the effect that the "wares" Mr. Eaton produced were of standard grade.

At present the old furnace is surrounded by a dense thicket so that it is not easily found, and being located about half way up a very steep bank, the difficulty in securing a photograph can be readily understood.

A walk of a mile brings the visitor to the modern blast furnace plant of the Struthers Furnace Co., on the bank of the Mahoning river. The striking contrast is simply another illustration of the marvelous progress made in one hundred years.

The ruins shown in the illustration are those of Hopewell furnace, of which Mr. James M. Swank says in his "Iron in All Ages": "The furnace stood on the west side of Yellow creek, about 1¼ miles from its junction with the Mahoning river in the township of Poland, in Mahoning county. On the same stream, three-fourths of a mile from its mouth, and on the farm on which the furnace of the Struthers Furnace Co. now stands, in the town of Struthers, another furnace was built in 1806 by Robert Montgomery and John Struthers. This furnace was called Montgomery. Thomas Struthers says: 'These furnaces were of about equal capacity and would yield about 2½ or 3 tons each per day. The metal was principally run into molds for kettles, bake-ovens, flat-irons, stoves, and irons and such other articles as the needs of a new settlement required, and any surplus into pigs and sent to the Pittsburg market.' The ore was obtained in the neighborhood. Hopewell furnace is said by Mr. Struthers to have had a rocky bluff for one of its sides. It was in operation in 1807, but it was soon afterwards blown out finally. Montgomery furnace was in operation until 1812, when, Mr. Struthers says, 'the men were drafted into the war and it was never started again.' This furnace stood 'on the north side of Yellow creek in a hollow in the bank.'"

The records show that the builder of the first blast furnace in Ohio was known both as Heaton and Eaton. The Connecticut Land Co.'s books, which have been examined at Poland, O., by a representative of *The Iron Trade Review*, show that Dan Heaton was the pioneer blast furnace operator in that section. From the "History of Trumbull and Mahoning Counties, Ohio," it is learned that his name was changed by act of the Ohio legislature to Eaton, the reason given in the application being that the original initial letter was superfluous. The Hopewell furnace was sold in 1807 for $5,600. In company with his brother, Dan Eaton built a furnace at Niles, O., in 1812, and later one on Mill creek.

New Books.

"Rogers' Drawing and Design" is an excellently printed treatise on drawing as applied to the mechanic arts. The first portion of the book treats of the drawing board, squares, etc., and their use, geometry, the development of surfaces and various methods of projection, blue-printing, tracings and working drawings. The second part deals with machine design and the third section contains a number of useful tables and other data. The volume has been the work of several writers; John Weichsel, M. E., has furnished most of the drawings and diagrams with text, and Henry E. Raabe, M. E., has been the technical editor. Other experts have given the work the benefit of advice and critical examination from manuscript to "proof" and the result is a creditable production. The engravings are clear and faithful copies of original drawings, and therefore the more suggestive of actual practice at the shop. The book is attractively bound in cloth with gilt edges and lettering, and contains 486 8 x 11½-inch pages, with a complete index. Published by Theo. Audel & Co., of New York. Price, $3.

"The Metric Fallacy," by F. A. Halsey and S. S. Dale, contains the arguments presented by the former before the A. S. M. E., and also includes an essay by Mr. Dale on "The Metric Failure in the Textile Industry." The vigorous indictment of Mr. Halsey against the proposed adoption of metric measurements by Congress, is sufficiently recent to require no extended introduction. The author has profited by the A. S. M. E. discussion to the strengthening of his case by further evidence and submits a powerful plea for the maintenance of the inch. His examination of the subject has tended to discredit a number of statements previously made in favor of the metric system and some stock arguments will need repairs before they are again submitted. There is much to be said on both sides, of course, but the scrutiny of Messrs. Halsey and Dale has resulted in a tonic of much efficacy to a cause that appeared at one time to have but the prospect of collapse. It remains to be seen how the supporters of a law enforced system will successfully cope with the new attack. The book is cloth bound, has 231 6 x 9-inch pages, and is published by the D. Van Nostrand Co. of New York. Price, $1.

Notice has been received in Omaha that the reduced rates on iron and steel announced by the Chicago Great Western railroad to take effect March 10 have been withdrawn by the company. The reduction was made on the west bound rate from Chicago to the Missouri river and amounted to 8 cents per hundred pounds. It is understood that the Great Western was induced to withdraw the proposed rates as it was feared they would cause a freight war among Western railroads.

Garrett E. Brownback, owner of the former March-Brownback stove foundry property at Linfield, Pa., has leased the plant to Mitchell, Van Meter & Co., of New York, who will engage in the manufacture of soil pipe and fittings.

Boilers and Chain Grate Stokers.*

BY A. BEMENT.

In this paper a steam generating apparatus is recognized as being composed of three principal features: Boiler, furnace and fire grate. The fact that some apparatus have no furnace but are composed of simply boiler and grate is also recognized. As the chain grate stoker is the only type of fire grate to be discussed, its functions may be defined as automatic feeding of the coal to the fire, and similar discharge of the ash; also supply of air for the combustion process. With the furnace its function is the correction of the necessarily imperfect action of the grate. That of the boiler is the absorption of the heat supplied to it.

The duty of the combined fire grate and furnace, or of the fire grate alone, is to assist in the production of heat and temperature, a distinction between which is recognized. The duty of the boiler consists in the transfer of this heat from the gases to water contained therein.

The automatic feature of the apparatus to be discussed is realized in larger measure than with any other type. For this reason the personal equation of the fireman is reduced to a minimum, and it lies largely in the power of the operating

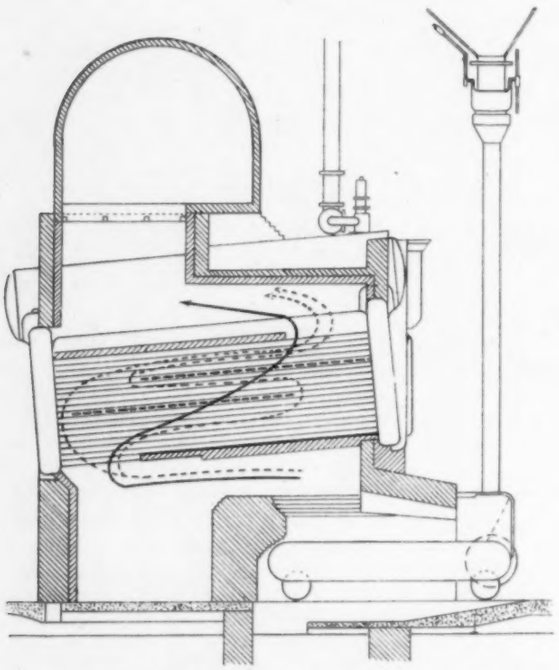


FIG. 1.—VERTICAL LONGITUDINAL SECTION OF NOS. 1 AND 2 AND IMPROVED HEINE BOILERS WITH TILE ROOF FURNACE.

engineer to secure good efficiency (provided the apparatus is of good character) because the manipulation consists very largely in fixed adjustments of the automatic stoker machine. The subject of the boiler will be taken first. For this purpose the performance of a Babcock & Wilcox, two Heine and one improved Heine boiler is given. Fig. 1 is a vertical longitudinal section which serves to show the improved boiler as well as that of the Heine design—the improvement consisting in the insertion of two horizontal baffles, which cause the hot gases to travel the length of the boiler three times among the tubes in place of one diagonal pass of the Heine design. In the illustration the path of the gases is shown by dotted arrows, and the two inserted gas baffles are indicated by the heavy horizontal dotted lines. The heavy arrow shows the travel of the gases through the tube surface of the ordinary Heine boiler. It will be seen that at the rear end of the lower inserted baffle of the improved boiler there is a considerable space provided for exit of dust. It has been found that a portion of the gas takes this passage and in so doing reduces its travel, so the full effect of the three passes was not entirely realized. In the application of this improvement to these boilers this opening was somewhat reduced.

Fig. 2 is a vertical longitudinal section of an example of the latest type of the Babcock & Wilcox boiler, having 5,000 square feet of heating surface, with large superheater. The boiler of this type to be discussed is a smaller example, but this illustration serves to show its relative features.

The expression "boiler efficiency" is used to designate the performance of the boiler only, not that of the combined apparatus; it implies the measure of the cooling effect produced on the hot gases, and neglects radiation and moisture in the steam. Two sets of experiments were made. The object of the first was to determine the relative efficiency of Heine boiler No. 1, and that of the Babcock & Wilcox. Their size was nearly equal, being slightly more favorable for the Heine.

The efficiency of a boiler will be influenced by the initial or furnace temperature, and by the capacity at which it is worked. So as the horsepower increases, the effect is to lower the efficiency, and as the initial temperature is lower, so is the heat transfer. As a smaller boiler will absorb less heat than a large one, the determination of its efficiency, according to some standard, becomes a complicated problem. With the measure of performance of the combined boiler and furnace based on water evaporated from and at 212 degrees, a factor of evaporation has been devised to place different conditions on a common basis but no factor, or set of factors, has as yet been devised to reduce various boiler performances to any standard of comparison. Therefore to determine the difference in efficiency between the boilers to be compared,

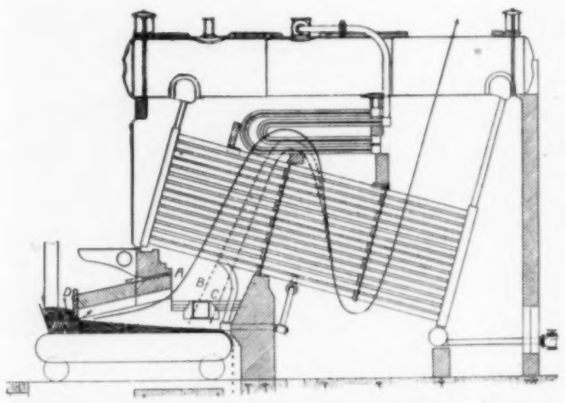


FIG. 2.—BABCOCK & WILCOX BOILER WITH CHAIN GRATE STOKER.

required that in each case the amount of heating surface, initial temperature and amount of water evaporated, be the same. These requirements being met, it then became possible to discover the relative value of the cooling effect produced. Conditions of operation being the same, the difference of cooling effect is shown by the difference in final temperature which in these tests was measured above that of the air supply; the steam pressure maintained in the plant containing the Heine boilers is 175 pounds, but with that of a Babcock & Wilcox a lower pressure prevailed. Therefore in calculating the curves of efficiency and fuel saving for this boiler, the temperature of escaping gases is taken as greater by an amount equal to the difference between the saturated steam temperatures. This is because the temperature of the cooling medium has an effect on efficiency and for this reason the correction is employed.

The initial temperature, or in other words, the condition of combustion, has more effect on the efficiency of the steam generating apparatus than has the cooling effect of the boiler. But high initial temperature is dependent not only on an efficient furnace and grate, but also on skillful manipulation of the fire, while superior boiler efficiency has a fixed value not dependent on the skill of the operator, and this value increases as the initial temperature decreases. There might be some question as to whether the full value of a good furnace would always be realized, but there could be no failure to realize the value of an efficient boiler.

The most remarkable feature of this matter of boiler ef-

*Extracts from a paper read before the Western Society of Engineers, Chicago, Feb. 17. The paper was accompanied by a number of comparative efficiency curves.

ficiency is that the simple addition of inexpensive baffles, with no labor cost for operation and requiring no additional room in the plant, gives results equal to an economizer requiring a large investment, considerable expense for maintenance, and a large amount of space for its installation.

The chain grate receives its coal at the front at a uniform rate, and in like manner discharges the ash at the rear. In this respect it is an ideal machine. But the fuel bed is necessarily of unequal thickness, and for this reason, the distribution of the air supply cannot be in proportion to the requirements at all points; for example, the front end of the fire is a comparatively thick mass of freshly ignited coal, from which the volatile matter is rapidly being distilled, while the back of the fire is a thin bed of coke, through which an excessive quantity of air flows. For this reason it is impossible to secure a good condition of combustion at the fire, or in other words a desirable mixture of fuel and air. The result is that unburned gases flow away from the front of the fire, while an excessive amount of air passes through the fire on the back grate. Fig. 2 illustrates this condition, the arrow A represents hydrocarbon gases flowing away from the front, while B and C indicate the path of the unused air. It is observed that the combustible gases and air do not come in contact to sufficient extent to mix with each other, but flow in unmixed condition among the tubes of the boiler, with the result that by the time the mixture is attained, the gases have passed a sufficient distance among the tubes to cause such reduction of temperature as to make chemical action impossible, and in addition to a low efficiency, smoke results. The apparatus shown in Fig. 2 may be described as the combination of grate and boiler, lacking the furnace feature.

Reference to Fig. 1 will explain what the author defines as the furnace. It will be observed that the bottom row of tubes of the boiler are encased in fire brick tiles, shown in Fig. 3.

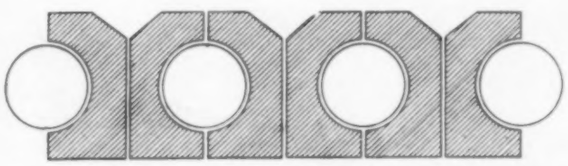


FIG. 3.—SECTION OF TILES ENCIRCLING LOWER ROW OF BOILER TUBES, TILE ROOF FURNACE.

The application of these tiles was devised by W. L. Abbott, and they extend beyond the bridge wall to within 3 feet of the opening to the tube surface. The intermediate space back of the encircling tiles is closed by the form shown in Fig. 4, which are those regularly supplied by the maker of the boiler, and leave the lower half of the tube exposed to the passing hot gas, and are usually known as the T tile. The distance from the coal gate at the front of the furnace to the end of this tile roof is 16 feet, a distance through which the gases must travel before coming in contact with the boiler surface except in the lower half of the bottom row of tubes. For a distance of about 3 feet back of the bridge-wall these are exposed, there being a distance of travel of 12 feet with no cooling effect, except that of radiation from the exterior furnace walls and through the tile roof. During the interval of time that the gases are moving through this distance of 16 feet their mixture is proceeding, so that before they have reached a point among the tubes where the temperature has dropped to a point below which union will be effected, the mixture is completed; or, as more generally understood, complete combustion is effected.

The plant contains the Heine boilers above mentioned and the tile-roof furnaces. Four tall chimneys serve 24 Heine boilers fitted with the tile-roof furnace; equipped with Babcock & Wilcox chain-grate stokers of a total grate area of 1,732 square feet, and having a total of 104,980 square feet of boiler-heating surface. The draught over the fire ranges from 0.15 to 0.45 inches of water. A shorter chimney serves four Babcock & Wilcox boilers with a total heating surface of 20,000 square feet, equipped with chain-grate stokers having a total grate area of 306 square feet; the draught over the fire ranges from 0.20 to 0.25 inches of water. The coal used, like all Illinois coal, will make much smoke when conditions are favorable. The appearance of the four chimneys which serve the tile-roof furnaces, proved that their capacity to produce an effective mixture is ideal when uniformly supplied with fuel, which the chain-grate effectually does. A photograph was taken [showing the chimneys to be smokeless] when all the furnaces which discharge into these four chimneys were in service and working at maximum capacity, burning about 40 tons of coal per hour, and the chimneys discharging more than 1,000 tons of gases in a like period. The grates under the Babcock & Wilcox boilers were working at a corresponding rate, and the smoke from this chimney [a moderate amount was shown in a photograph exhibited by the speaker] was not due to lower draft, because the strength of draught measured over the fires shows that a portion of the tile-roof furnaces have less than the Babcock & Wilcox boiler grates. There is of course a stronger draught in a tall chimney than in a short one, but this does not necessarily mean that draught at the fire is in proportion, because of different resistance of connecting flues. With each of these two kinds of apparatus the conditions of fuel, fire and air supply are the same; the only difference is that one is equipped with an effective furnace and the other is lacking in the furnace feature.

The theory of the action of the tile-roof furnace may be given as follows: The coal entering at the front of the furnace has its volatile matter rapidly distilled in the form of a hydrocarbon gas, and flowing back meets a larger air supply from the back of the fire, where the fuel bed is thinner, and being thoroughly mixed in the chamber below the tile-roof it becomes, strictly speaking, a finished product of combustion which carries its heat from the furnace to the boiler. Assuming that the action of this furnace is as described, it would appear possible to obtain complete combustion with no air in excess. With one of these furnaces carefully worked and the air supply proportioned to the amount of coal being burned, by proper adjustment of the draught, it was possible to maintain an average of 17 percent CO^2, and for a few short

FIG. 4.—TILES CLOSING SPACES IN LOWER ROW OF BOILER TUBES BACK OF ENCIRCLING TILES.

intervals as high as 19.3 percent. Under such conditions, increase in the feed of coal would result in the apparent attainment of the theoretical maximum CO^2, after which any further increase in coal feed resulted in drop in CO^2, because coal being in excess, air was deficient, and some carbon oxidized to CO only. But no carbon was set free, therefore no smoke was produced.

Thus far, two of the features of the steam generating apparatus have been considered and a remarkably efficient example of each described, the tile-roof furnace appearing as an ideal device, and the improved Heine boiler as a remarkable example of an efficient apparatus. It is probable that this is the most efficient boiler of which there is any record. About the highest efficiency previously reported is that of a Thornycroft boiler, by Professor Kennedy, showing 86.8 percent of the heat absorbed when evaporating 1.24 pounds of water per square foot of heating surface per hour, with a condition of combustion about the same as that with the improved Heine. Under these conditions the gases left at 41 degrees Fahrenheit above steam temperature. With, however, an evaporation of 3.2 pounds of water per square foot of heating surface and somewhat better combustion, the gases left at 165 degrees above steam temperature. In the case of the improved boiler the gases left at 92 degrees above steam temperature, when evaporating 4.17 pounds of water per square foot of heating surface per hour.

It is now in order to examine the chain-grate stoker, and discuss its characteristics from the standpoint of relative fuel and air supply. In this respect it is decidedly at fault, because the relative proportions of the machine are such that the air supply is greatly in excess of requirements, especially when such stokers are in combination with a furnace. This

matter of air in excess is one that appears difficult for many to realize; the effect is to increase the amount of gas to be heated, but takes no part in heat production. The result is that the heat is expended in raising the temperature of a correspondingly larger amount of gas. For this reason its elevation of temperature is less because the fixed amount of heat must be distributed to a large amount of gas, and necessarily will not raise its temperature as high as when added to a smaller amount of gas. This is forcibly illustrated by observing the fact that a certain quantity of heat may be present in a small amount of gas, at a temperature that will melt iron; or a like quantity of heat be present in a large amount of gas at a temperature that will freeze water, the heat being the same in each case, but the containing mass greatly different, which results in a corresponding difference in temperature. Thus is the distinction between heat and temperature illustrated. Heat only flows from a region of higher to one of lower temperature, and as the difference of temperature is greater, so is the rapidity or thoroughness of its transfer. This fact is of great importance with a boiler, because of the brief interval during which gases are in contact with it.

With a chain-grate stoker lacking the furnace feature, excessive air supply is effective in reducing incomplete combustion, but this phase of the matter has no application to the tile-roof furnace, and so will be discussed later.

The magnitude of the heat loss owing to excess of air, or in other words low initial temperature, presented directly in money loss may be useful. With coal of 10,000 B. T. U. per pound, at $1.50 per ton, final temperature of 670 degrees F. and air present equal to three times that actually required, the loss owing to this excess will cost $0.45 per ton of coal actually burned. A smokeless chimney is evidence of complete combustion but not necessarily of economical condition;

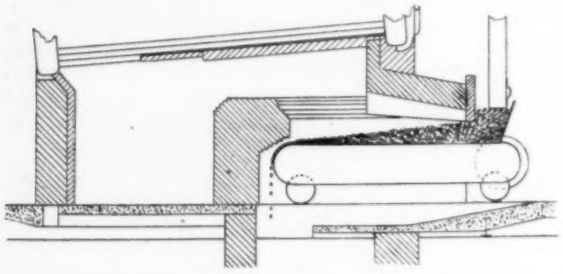


FIG. 5.—FURNACE AND STOKER WITH THIN FIRE.

and the cause of low efficiency is often ascribed to such minor losses as blowing of safety valves, coal used to bank fires, and fuel lost in the ash pit, ignoring the important loss due to air, as well as that of incomplete combustion.

The air leakage with chain-grate stokers is from three sources: First, at the back between the grate and bridge-wall; second, through the coal in the hopper and under the coal gate; third, through the fuel bed. The remedy for the first consists in closing the openings at the sides of the stoker frames, between the bottom chain and the floor under the stoker, and between the upper and lower chains. This latter requires not only a damper extending from each chain, but that it have horizontal extensions sufficient to extend across, and make a close contact with two joints of the chain, because with a simple vertical damper air can pass its edge by way of the space between the thin portion of the chain links. In addition to this, a tight ash-pit is required. This period consists in preventing air reaching the opening at the back of the grate instead of closing the opening at this point. Various schemes have been employed to prevent leakage at the end of the grate, by building the bridge-wall extension so that it is close to the grate, and by using a water cooled metal box or pipe similarly located. These methods, however, are less effective than that first mentioned, and have some objectionable features.

The remedy for the second source of leakage consists in a greater depth of coal in the hopper. Arrow D, in Fig. 2, shows how such leakage occurs. The third class of leakage, that through the fire, can be corrected by maintaining a thicker fuel bed.

The lowest obtainable air supply in the tile-roof furnaces at full draft, with the chain grates as installed by the maker, ranged from 475 to 315 percent, which was reduced by closing the air leaks about the chain, and by maintaining a greater depth of fuel in the hopper, to 250 to 200 percent under best conditions.

Fig. 5 shows the tile-roof furnaces with the stoker machine as originally installed, but the coal hoppers have been made deeper, and the coal feed spouts shortened. As will be observed, the fire on the grate and coal in the hopper are shown at maximum thickness, which thickness is not sufficient to utilize the full air supply; for this reason it is proposed to raise the igniting arch, and to proportion the coal gate and hopper so that a condition as indicated in Fig. 6 may be realized. Here the coal hopper is so deep as to require an extension handle by which the spout may be moved, and as the temperature at the front of the furnace will be high, on account of the reduced air leakage through the coal in the hopper, provision must be made to prevent the coal catching fire before it reaches the bottom of the gate. To accomplish this, a closed air space on the front side of the gate is shown.

With chain-grates as at present proportioned, the available thickness of fire is such that highest efficiencies are had with lowest draught, especially when it is induced by a chimney or fan. Increasing strength of draught is accompanied by drop in efficiency owing to increasing air supply, but capacity rises to a certain maximum, after which it begins to fall, owing to the rapidly diminishing initial temperature overcoming the advantage of increasing quantity of heat generated. If intensity of draught be carried far enough, capacity and efficiency will fall to zero, because the initial temperature owing to increased excess of air will become too low to ignite the coal. In other words, the fire will go out. This is proved

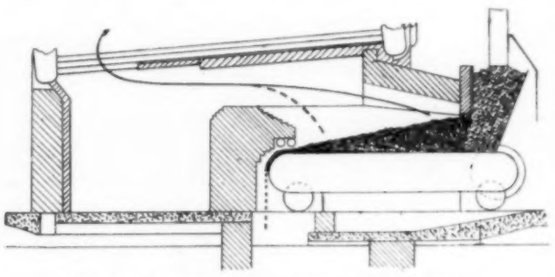


FIG. 6.—FURNACE AND STOKER WITH THICK FIRE.

by the fact that in ordinary everyday experience with strong draught, when the coal is comparatively large in size it fails to ignite, and the operator learns by experience that the remedy lies in partially closing the damper.

One of the apparent faults of the chain-grate, is that it discharges a quantity of unburned coal with the ashes; the remedy for this is extremely simple, and consists in operating the stoker so that the fire is burned out before it reaches the end of the grate. But it is found with stokers as at present proportioned, that this results in such increase of excess of air as to offset the gain. Therefore, the thick fire is offered as a remedy for loss of coke in the refuse. Why this result may be expected is explained as follows: Let it be assumed for example that a fire 17 inches thick at the front, and in the tile-roof furnace, with its end at the end of the grate, results in the fuel being in excess, or in other words air deficient. Such condition may be remedied by reducing the speed of the grate, so that the fire burns out before it reaches the end, the result is that more air flows in at the back which satisfies the combustible gas from the front of the fire, by mixing with it in the chamber of the furnace, resulting not only in full heat development, but attainment of maximum temperature.

According to the above, the usual form of overhanging bridge-wall would have no office to perform. This in fact is true. As, however, there is danger that careless stoker operators will, owing to inattention, allow fire to go over the end of the grate, some form of bridge-wall could (if necessary) be employed. The best and least expensive scheme of this character is shown in Fig. 6, consisting of two metal pipes joined at the inner end by a return bend, water flowing in to

one pipe and out of the other, above which the brick wall is built. Such a feature, however, should be unnecessary, because it is an expensive and inconvenient form of insurance against carelessness.

Such coal as described, owing to the large percentage of small size, does not make a very good fuel bed, because it cakes together more or less, forming compact masses of coke which are more or less separated, allowing air to enter between. But such coal contains the greatest quantity of heat to be had for the money in this market; therefore it is the most desirable fuel for steam making, provided it can be used to advantage.

If this scheme of thick fire on a chain-grate in such furnace as the tile-roof, is studied, it appears as a means of equalizing the effect of all the irregularities of the fire. As shown by the arrows in Fig. 6, the gas from the back (containing unused air) meets with the gases from the front (containing unused volatile combustible) and they join as an ideal finished product, provided the ingredients are supplied to the grate in the proper relative quantities.

The foregoing has dealt principally with the chain-grate located in a furnace, and it is now in order to examine the performance of the grate without a furnace. Such apparatus is shown in Fig. 2. As illustrated, a portion of the volatile combustible matter flows from the front of the grate and escapes, without mixing with the large excess of air from the back. What this loss may be is indicated in the test between the Babcock & Wilcox and Heine boiler No. 1, the essential features of which are as follows:

	Babcock & Wilcox.	Heine No. 1.
1. Efficiency of combined boiler and furnace	57.83	59.12
2. Efficiency of boiler	77.69	70.12
3. Superior efficiency of boiler	7.57	.....
4. Superior efficiency of furnace	....	8.86

Item 1 includes all losses except that of combustible in the refuse, all other losses except hot gases and combustion being the same for each apparatus.

Item 2 is the measure of the cooling effect produced by each boiler.

Item 3 is the difference in cooling effect produced by the two boilers. The superiority of the tile-roof furnace under the Heine boiler is due to complete combustion, the loss by escaping volatile combustible with the Babcock & Wilcox being 8.86 percent. Larger air supply is effective in reducing this loss, but the magnitude of the loss from the resulting greater quantity of unused air, overbalances the combustion gain.

From the curve of loss owing to unused air, it appears that the percentage of excess may be reduced to below 80 to advantage, from which it appears to be an economical measure to produce incomplete combustion for the sake of reducing excess of air. This is true; in fact, with a chain-grate under such type of boiler, it is impossible to reduce the excess much below 80 percent under most favorable conditions. As escaping volatile combustible results in smoke with such type of apparatus, smoke production and highest attainable heat efficiency go together, and one may judge of efficiency by the appearance of the chimney. The character of the coal has a most important influence on the amount of escaping volatile combustible. For example, ordinary screenings form a more or less compact mass, preventing to a large extent entrance of air to all portions of the fuel bed; for this reason there is but poor mixture between fuel and air at the grate. With washed coal of a uniform and desirable size, results are very much better; in fact, even unwashed coal of corresponding size produces an improvement. The reason is that the openings between the pieces of fuel are sufficient to allow air to penetrate largely to all portions of the bed, thus assuring a better condition, because less volatile combustible escapes. And because of more thorough contact between air and fuel, a larger amount of coal is burned; for this reason air leakage from various sources is proportionately less. Therefore the use of washed or properly sized coal will result in greatly reduced volume of smoke over ordinary screenings. But with each kind of fuel, the maximum amount of smoke indicates maximum heat efficiency. This type of apparatus is considered as being suitable for the use of "cheap fuel." It is made for that purpose; specified by engineers, and purchased with the understanding that it will insure a realization of such hopes, and the result is that disappointment is often experienced.

It is sometimes believed that a thin fire is of economical advantage, and an effort to improve conditions by such means is adopted, with disastrous results as far as economy is concerned.

The improved boiler, and suggested chain-grate, together with the tile-roof furnace, afford means of obtaining an ideal efficiency. But the present demand is largely for an apparatus that will produce superheated steam, and with the Heine boiler there is no adequate location for a superheater. With the Babcock & Wilcox, however, there is an ideal location. The gases coming in contact with it after having passed through the boiler once, are at a temperature low enough to avoid damage to the pipes, and yet high enough to do efficient work. That the improved boiler may be equal in this respect to the Babcock & Wilcox, requires that it be equipped with a superheater located between the first and second gas passes, so that it will be acted on after the drop in temperature of the first pass has occurred.

The Technolexicon.

The universal technical dictionary for translation purposes, in English, German and French, the compilation of which was begun in 1901 under the auspices of the Society of German Engineers, has received help up to the present time from 363 technical societies; 51 of these are English, American and South African, 274 German, Austrian and German-Swiss, and 38 French, Belgian and French-Swiss societies. Of firms and individual collaborators 2,573 have promised contributions.

The excerption of texts in one, two or three languages (handbooks, pamphlets, business-letters, catalogues, price-lists etc.) and of the existing dictionaries has yielded 1,920,000 word-cards so far. To these will be added within the next two years the hundred thousands of word-cards that will form the result of the original contributions—those already sent in and those still expected—of the 2,573 collaborators at home and abroad, when the editors in Berlin have finished them for the press. Specially made handy note-books had been placed at the disposal of the collaborators to write their collections in, of which 317 have come in filled so far. All the outstanding contributions will be called in by Easter of this year. The collaborators are therefore requested to close their note-books or other contributions by the end of March and to forward them to Dr. Hubert Jansen, Berlin (N. W. 7), Dorotheenstrasse 49.

Among the recent achievements of many business concerns of Baltimore in resuming operations after the great fire of Feb. 7 and 8, that of the *Manufacturers' Record* is worthy of special mention. Its printing house was destroyed together with much matter in type and manuscript for the issue of Feb. 11. It was impossible to publish the paper in Baltimore, and arrangements were hurriedly made to have the printing done in Philadelphia. The question how to provide cuts for the advertising pages was met with the assistance of photo engraving, which furnished the means for plates for the full advertising pages as they stood before the week of the fire. The *Record* appeared as a 100-page paper, without a single department omitted, on the regular publication day.

Operations have been begun on the Lone Jack mine near Hartville, Wyo. The ore, while existing in large quantities, is said to be of a low grade, running high in silicon. Mining is still continued at the Sunrise mine, as well as at the Village Belle and Gambell mines. The ore of all these mines is used by the Colorado Fuel & Iron Co.

Alleging that he was made a victim of a conspiracy which deprived him of the presidency of the company he promoted, Thurston L. Knudtson has started suit against the T. L. Knudtson Machinery Mfg. Co. of Chicago, and the court has issued a temporary injunction to prevent the officers of the company from taking action inimical to Knudtson's interest.

RECEIVED FROM THE TRADE.

The general catalogue of the Brown & Sharpe Mfg. Co., of Providence, R. I., shows a number of additions in the 1904 issue. The No. 00, 5-16 x 10-inch, automatic cutting off machine, heavy combination squares and protractors, plain and universal milling machines of various sizes, together with many improved smaller tools and machines, have been added to an already long list. A new clamp ring has been applied to a number of micrometers and has no threads to wear or catch dirt and as only a slight movement of the ring is required to clamp the measuring spindle firmly there is practically no wear on the parts.

The volumes of the "F" catalogue from the Simmons Hardware Co., of St. Louis, epitomize the hardware industry in builders' supplies, harness, metal goods, etc. The color work is an ambitious feature of an extensive undertaking and a gratifying measure of success has been attained in the reproduction of artistic effects in metal finishes of various kinds. The oldest shovel in the country, views of different buildings, a comprehensive index and a suggestive arrangement of builders' fittings and trimmings so that a house, for example, can be fitted with goods in harmony—are noticeable features in a remarkably elaborate catalogue.

A catalogue of a recently patented pulley guard comes from Miles Buckley, of Wassaic, N. Y. The invention consists of a number of wooden sections connected together with their inner surfaces shaped to conform to and cover that portion of the pulley face left exposed by the belt. The sections are mounted upon iron brackets and are made in many sizes. An offset is made on one of the supporting brackets to hold the belt when thrown off the pulley.

Bulletin No. 8 from the Electric Controller & Supply Co., of Cleveland, deals with Dinkey ventilated controllers. The original type was brought out at the Homestead Steel Works of the Carnegie Steel Co. for the rough handling incident to mill work. The controller has but a single lever for forward and reverse and is a self-contained unit designed for severe overloads and ready accessibility. The bulletin is profusely illustrated.

The National Electric Co., of Milwaukee, Wis., takes up in Catalogue No. 60 a line of rotating field alternators up to 1,500 kilowatts capacity. These machines are dissected for detailed discussion and the points of interest are prominently displayed with excellent halftones.

A card from the R. D. Nuttall Co., of Pittsburg, is of timely value and contains Japanese weights and measures with their equivalents and a few terms connected with gearing in the two languages. The card is considerable of a curiosity.

A catalogue comes from Herman Kühne, Ltd., Victoria street, London, Eng., descriptive of Steinle's steel mercury thermometers. These instruments have a range from zero to 950 degrees Fahrenheit. A graphite thermometer of the same make works up to 1,250 degrees Fahenheit but for very short periods may be employed to a limit of 1,800 degrees Fahrenheit. This information is taken from the catalogue which gives particulars of the construction and purpose of the devices.

Calendars have recently been received from N. & G. Taylor Co., of Philadelphia; the Vulcan Iron Works Co., of Toledo, O., and the National Acme Mfg. Co., of Cleveland.

Catalogue T of the Hilles & Jones Co., of Wilmington, Del., contains many illustrations of machine tools for working plates, bars and structural shapes. A line of shears, punches, bending rolls, plate planers, and belt, motor and steam engine driven, is freely shown with numerous halftones.

A folder from the Westinghouse Electric & Mfg. Co., of Pittsburg, describes auxiliary apparatus for railway equipment. This comprises various switches, lightning arresters, fuse blocks, choke coils, etc.

Accompanying the price list of the Phosphor-Bronze Smelting Co., Ltd., of Philadelphia, is an announcement that the new rolling mill is now in successful operation with other improved facilities.

A recent circular from the Crosby Steam Gauge & Valve Co., of Chicago, briefly mentions the many specialties in steam fittings made by this firm.

The Norwalk Brass Co., of Norwalk, Conn., has a new catalogue of marine hardware, gas engine parts, automobile fittings and special castings.

Bulletin L-508 of the Laidlaw-Dunn-Gordon Co., of New York, is devoted to a new type of air compressor. The distinguishing feature of this machine is the novel manner in which the opening and closing of the exhaust ports are controlled. The exhaust opens through poppet valves and the closing of the exhaust is determined by Corliss valves located in the passages between the cylinder and the poppet valves. The opening and the closing of the admission are determined by the Corliss valves entirely. These and other novel features of this compressor are fully explained in the pamphlet.

The latest catalogue of the Oesterlein Machine Co., of Cinnati, clearly describes the details of the milling machines made by the company. Some account is also given of the Oesterlein universal cutter and tool grinder. The pamphlet is well illustrated.

The development of wire fencing for special purposes is interestingly told in a booklet from the Union Fence Co., of New Haven, Conn.

Catalogues of grinding and polishing machinery and woodworking machines come from the Valley City Machine Works at Grand Rapids, Mich. A variety of grinders, wet and dry, for bench and otherwise, are enumerated and the woodworking machines comprise carving lathes, routing and rosette machines, sanding and spiral twist machines, etc.

Joseph V. Woodworth, of Brooklyn, N. Y., an occasional contributor to the columns of *The Iron Trade Review*, has a circular outlining his work as a consulting expert in metal working.

Harris & Co., of Chicago, reprint in circular form the description of their molding machines as given in *The Iron Trade Review* of Feb. 4.

Types of Steel Columns.

The forms of steel columns commonly employed are two channel beams, back to back or face to face, laced together; two channel beams, back to back, joined by two plates riveted to the outer webs of the channel beams; two channel beams, back to back, united by an I-beam; four Z-bars united by a plate; four angle-bars united by a plate; four angle-bars laced together; a single I-beam; a single angle-bar; a single I-beam of special form, rolled with deep flanges so as to have an H section; four angle-bars, box-laced; four angle-bars, starred. Besides these there are the special columns known as the Larimer and the Gray.

For side columns, where the loads are not excessive, four angles laced is probably the best, but under certain circumstances the column of four angles united by a plate is to be preferred. A single I-beam makes a good end column when proper connections are made. The best column for the corner of a building is an equal-legged angle with 4, 5 or 6-in. legs. Columns made of two channels laced, or two channels and two plates, are used where moderately heavy loads are to be carried. The former form, wherein the channel beams are turned back to back, is most commonly employed, but the same form wherein the backs of the channels are turned out gives a better chance to make connections. The shop work on the latter used to be more than on the former, but this is no longer the case. The column composed of two channel beams united by two plates is a closed section, and is seldom used on that account.

For the support of very heavy loads the column made of two channel beams and one I-beam, or that composed of four Z-bars and a plate, is commonly used, the former being a very economical one and especially advantageous, since it can be built up of material that is always easily obtainable. Connections for beams can easily be made with either of these forms of columns. The special I-beam column with flanges equal to the depth of the beam is now being rolled in Germany; this is an almost ideal column for heavy loads, having all the advantages of the Z-bar column with a very much smaller shop cost. Columns made of four angles box-laced are used where

light loads are to be carried by long columns. The column formed of four angles starred, which is frequently used, is a poor design, inasmuch as the radius of gyration is very small for the cross-sectional area. Columns made of two angles, starred and fastened at intervals of two or three feet by means of batten-plates, are frequently used for light loads. The Gray and Larimer columns are patented forms. The latter is used rather extensively; the former is but little used.—[Engineering and Mining Journal.

The Northwestern Foundry Co., Minneapolis, Minn., has been awarded the contract for supplying special castings for the water works department of that city at $50 per ton. J. B. Clew & Co., of Cleveland, will supply the valves for the water mains at prices ranging from $12.60 to $16.00, according to size. All bids for fire hydrants were rejected.

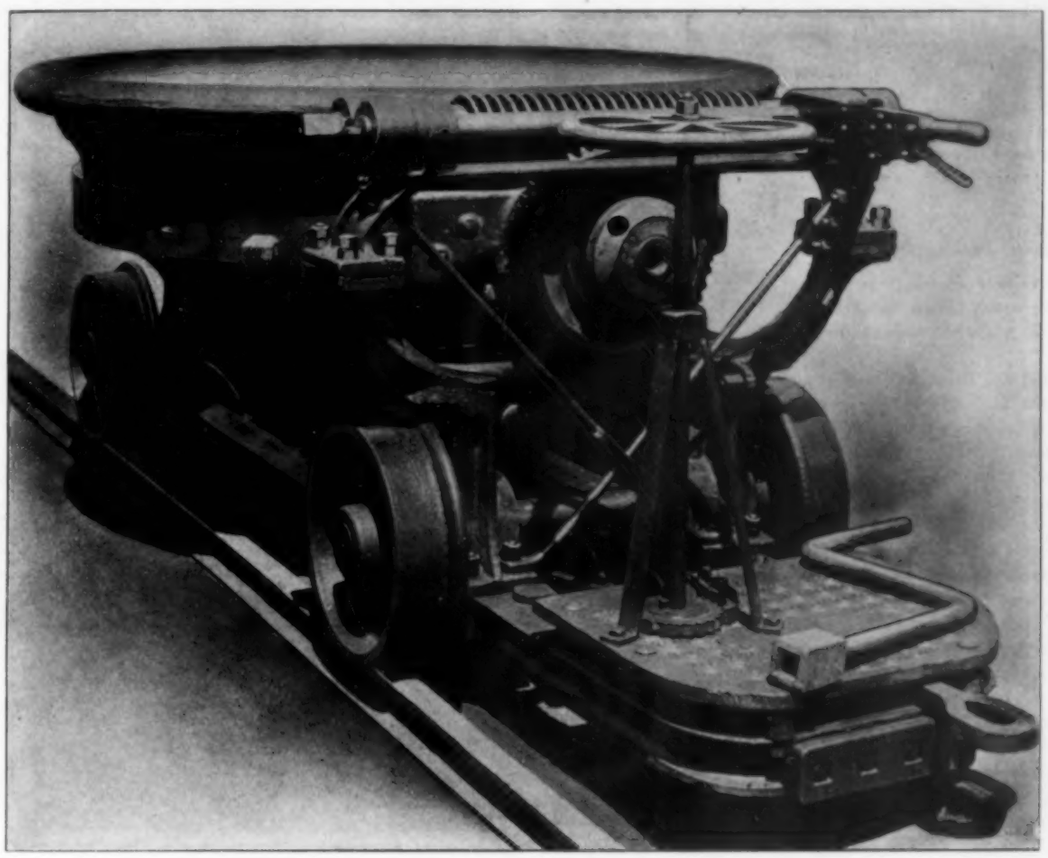
On account of the increased tariff on farming implements, steel rails, steel workers' tools and other articles, which will become effective in the republic of Mexico April 1, large quantities of these articles are now being exported into Mexico. German exporters will feel, even more keenly than those of the United States, the effect of this increased tariff.

A bill has been introduced in the Canadian Parliament entitled "An act respecting aid to the Algoma Central & Hudson Bay Railway." The bill guarantees a loan of $2,000,000 to the reorganization committee of the Consolidated Lake Superior Co. This amount, with the other funds now available and in the hands of the committee, will provide a total of $7,000,000 to complete the work of reorganization.

The Newburg & South Shore railroad will, it is expected, be ready for business May 1. The road has been about two years in building and is intended primarily as a connection between the steel plant of the American Steel & Wire Co. at Cleveland and the Central furnaces of the same company.

A NEW DESIGN IN SLAG CARS.

The slag truck illustrated is one of 25 cubic feet capacity, with patented worm releasing attachment, invented by N. V. Fitts, chief engineer of the Colorado Iron Works, at Denver, Col. The idea of the device was suggested to Mr. Fitts on noting that at many smelters, notably at the Globe plant of the American Smelting & Refining Co., it was necessary to rack the bowl over with the screw to pour off the surface slag, rack it back again to an upright position to move the truck to another place, rack the bowl over again to dump the skull that adheres to the bowl and finally rack it back again to run the truck back to the furnace. The worm is held by a pivoted connection at the one end and a retaining latch at the other and with the releasing device the operator screws the bowl over the first time so that the skull will not go out with the slag, then the worm is disengaged by means of the lever and the bowl being so designed that it is top heavy when full and bottom heavy when empty, it rights itself at once. The object of the invention is readily understood that when the bowl is in a dumping position and ready to be returned to the upright one by the slow process of working the bowl back by the worm and gear, the former is disengaged from the latter and the bowl rolls back by reason of the center of gravity being below the center of the bowl trunnions. The bowl of this truck is carried in a heavy wrought iron band with trunnions and held in place with keys. When the operator wishes to dump the skull, the worm is thrown out (or can be left out) and the bowl dumped by a bar, and, as already described, will always return to an upright position, when the worm can be dropped into gear and the bowl refilled from the furnace.



A NEW SLAG CAR.

The bowl being top heavy when full it can be dumped rapidly by throwing up the worm and allowing the load to go over with a run which is usually done when it is not necessary to save the skull. The patent covers the top and bottom heavy features and the combination for lifting the worm with a rock shaft; an interference suit on a device covering a rock shaft with eccentrics at the end having been decided before the Fitts' patent was issued.

RAILWAY STEEL SPRING CO.'S REPORT.

The directors of the Railway Steel Spring Co., at a meeting held last week, decided to declare a dividend of 2 percent on the common stock. This is the first dividend on the common since the organization of the corporation.

The general balance sheet of the company, as of Dec. 31 last, is a strong one. The total surplus of the company now stands at $1,705,885, an increase of $802,097 as compared with 1902. Cash on hand is given as $1,558,043, an increase of $1,122,855, as compared with 1902. The accounts payable are less than $120,000, while the accounts receivable have been reduced $703,230 and now are $1,452,865.

The balance sheet of the Railway Steel Spring Co., as of Dec. 31 last, follows:

ASSETS.

	1903.	§Increase.
Plants	$24,437,511	$281,114
Merchandise	1,216,761	*66,063
Stocks and bonds	142,905	41,820
Accounts receivable	1,452,865	*703,230
Other items	48,724	30,099
Cash	1,558,043	1,122,855
Total	$28,955,809	$706,595

LIABILITIES.

Preferred stock	$13,500,000	.....
Common stock	13,500,000	.....
Accounts payable, etc.	119,315	*$137,531
Reserved for dividend	130,609	42,029
Surplus	1,705,885	802,097
Total	$28,955,809	$706,595

*Decrease. §Changes from 1902.

The president in his report says: "The above statement shows the result of the operations of the steel tire and wheel department and the rolling mills since the organization of the company."

The Railway Steel Spring Co. was incorporated under the laws of the State of New Jersey in February, 1902. The company manufactures railway springs, steel tired wheels and kindred articles. It acquired the stocks of six concerns. The capital is $27,000,000, divided equally into common and preferred.

The C. O. Bartlett & Snow Co., of Cleveland, reports good orders, during February, from the Sandusky Portland Cement Co., Iroquois Portland Cement Co., American Steel & Wire Co., United States Gypsum Co., Cleveland & Sandusky Brewing Co., Lennox Chemical Co., Grasselli Chemical Co., Layland Sand & Stone Co., Struthers Furnace Co., Payne Consolidated Mining Co., B. C. Leisy Brewing Co., Beltz Brewing Co., The H. Huennekes Co., The Dorset Milling Co., and the National Carbon Co., with a fair number of small orders. Prices are close and it takes plenty of good hard work to get orders. Inquiries are quite numerous, and judging from these President Bartlett says there is no reason why the coming season should not be a busy one for the company. "If the workingmen," he adds, "will meet the manufacturers half way, and concede something in their wages, we do not see why the business during the coming year should not be a profitable one for us; but on the other hand, if they insist on antagonizing the manufacturers, there will be serious breakers ahead."

The Cleveland Pneumatic Tool Co. states that it has found the condition of trade quite satisfactory. While it has had no large or important orders from any section of the country, it has had small orders from all over the United States and Canada, and its foreign trade has been fair. Since the Scotchman's saw, "Many a mickle makes a muckle," is still true, there is no cause for complaint. The company hopes to see organized labor accept the situation in the same manner that the employers have to accept the condition of business, believing if this is done the year 1904 will be reasonably satisfactory to all interests concerned.

Proposals for the following supplies were received at the U. S. Engineer's office at Cleveland, March 2: 16,500 ¾ x 14-inch lag screws, gimlet point, weight 26,730 lb.; 28,000 ½ x 9-inch boat spikes, weight 18,655 lb.; 20,000 13-16 standard round washers, weight 1,800 lb.; 20,000 11-16 standard round washers, weight 1,540 lb. The bidders were: The Bingham Co., the Pattison Supply Co., the Lamson & Sessions Co., Weed & Co., the Lake Erie Iron Co., the Oliver Iron & Steel Co., the Bostwick-Braun Co., the Michigan Nut & Bolt Co., the Upson Nut Co., the Bassett Presley Co., the Luetkemeyer Co., A. G. Hathaway & Co., the Bourne-Fuller Co., the Worthington Co., and the McIntosh Hardware Corporation. The Pattison Supply Co. received the order as follows: Lag screws, 80 and 20 off, or $3.33 per 100 screws; spikes, $1.80 per 100 lb.; washers, 6.67 off. On screws the bids ranged from $6.20 per 100 to $3.83; on spikes, from $2.35 per hundred to $1.80; on washers, from $2.80 per hundred pounds to $2.10.

The boiler plant of the B. F. Sturtevant Co.'s new works at Hyde Park, Mass., is now in full operation. This plant comprises three 250-h. p. Stirling boilers equipped with Jones underfeed stokers, air for which is furnished by a 6 foot x 28-inch Sturtevant steam fan operating at 2½-oz. pressure, a 9 foot x 1½-foot Sturtevant induced draft steam fan, and an economizer will be installed later of their own make. The maximum steam pressure carried will be 150 lb. Fire was started under these boilers on Dec. 23. The company has in process of construction a 400-h. p. structural compound engine with direct-connected 250-k. w. generating set, which will be the first of several units to be installed in the engine room.

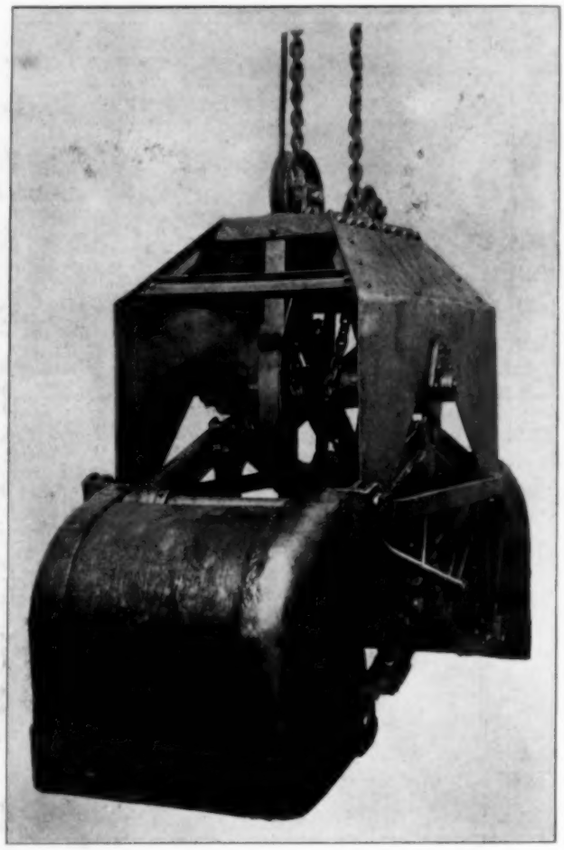


FIG. 1.—THE SWEDENBORG CLAM SHELL BUCKET.

A contract for furnishing book stacks for the new Carnegie building for the public library at Syracuse, N. Y., has been awarded to the Snead & Co. Iron Works of Jersey City, N. J. The company's bid was $10,400, it being the lowest of six bidders.

The Argentine Republic has placed orders for 20,000 tons of steel rails with two manufacturers at Liege, Belgium, and it is expected that Liege firms will secure orders for 3,000 tons of bridge building materials from the same government.

A NEW CLAM SHELL BUCKET.

A new type of clam shell bucket has made its appearance and has created much interest among dock and furnace men. This bucket is the "Swedenborg" and is manufactured exclusively by the Macbeth Iron Co., of Cleveland.

There is nothing experimental about the bucket, as it has been thoroughly tested on the ore unloading docks of Lake Erie. One of the docks of the United States Steel Corporation, at Fairport, O., is equipped with them, and the bucket has also been used with equal success on the docks at Ashtabula Harbor, O.

The illustrations, Figs. 1 and 2, give a general idea of the design, construction and method of operation. The closing force is applied through a power wheel and pinion, meshing with steel geared segments which carry the front of the scoop. This mechanism in connection with the toggle effect of the links, gives an extremely powerful closing action. The backs of the scoops are carried by links, each scoop being connected to the geared segment on the opposite side. This combination of driving from the front of the scoop and carrying the back from the opposite segment, gives the bucket a powerful and effective digging motion. The bucket is of very strong and rigid design and construction, everything being made of steel, no iron whatever being used.

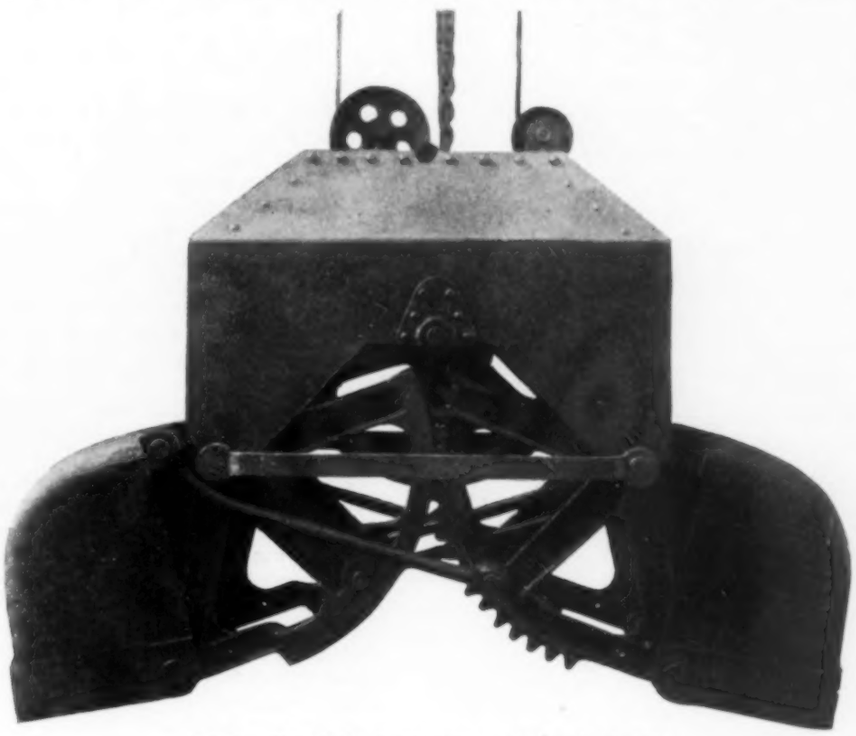


FIG. 2.—SIDE VIEW OF THE NEW CLAM SHELL BUCKET.

At first sight the objection might possibly be raised that the ore or other material would get into the geared segments and cause them to bind. This has been obviated by cutting away the bottom of the teeth entirely on one segment and making a V-shaped bottom of teeth on the other. Absolutely no trouble whatever has been experienced from this cause during the year or more these buckets have been in continual operation. The bucket is of relatively light weight, which is, of course, an important consideration when equipping existing rigs with them and has the remarkable capacity of picking up 25 percent more ore than its own weight.

The cuts show the device with a power wheel and two closing lines, the lines being on the longitudinal center line of the bucket. The second line is merely for the purpose of steadying the bucket. Two power wheels are substituted if the nature of the equipment demands it, thus placing the closing lines the opposite way, or one line only may be used if other means are provided for steadying the bucket. The opening is accomplished by means of a chain running around a small hub on the power wheel shaft and the operation is the reverse of the closing, with the exception that it is much quicker.

This bucket, although primarily intended for iron ore, is equally well adapted for handling coal, sand, and other coarse material. It is also an efficient and economical means of excavating and dredging. The Macbeth Iron Co. builds revolving derricks, bridges and any special design of equipment for handling material, either with clam shell buckets or without.

The Whitney Safety Firearms Co., Newport, R. I., recently incorporated with a capital of $150,000, is conducting its business in what was formerly known as "The Aquidneck Cotton Mill." It has secured this property, which is in every way suitable for its needs, and does not, therefore, intend to build. The company will manufacture a full line of Whitney safety firearms, double and single shotguns, revolvers, magazine pistols and magazine rifles. The safety principle, which is used in connection with these arms, is the invention of the late William H. Whitney, father of the treasurer and superintendent of this company. The various arms will be manufactured in five departments, each practically a factory in itself. The company expects to begin manufacturing by April 1, and to begin deliveries in about sixty days thereafter. When the plant is operating to its capacity it will give employment to about 1,500 skilled mechanics. The establishment of this industry in Newport is of more than ordinary significance, because it marks the triumph of the Business Men's Association of that city over the wishes of some of the citizens, who fear that if manufacturing plants are located in the city, the place will not be so popular as a summer resort. The Association hopes to induce other companies to locate in Newport, thus relieving the stagnation from which the city now suffers during the winter months.

William Nelson Cromwell, counsel for the reorganization committee of the United States Shipbuilding Co., announces that the modification of the original plan of May 25, 1903, has been assented to by the holders of more than $12,000,000 of the first mortgage bonds (being 80 percent of the total issue), and by $10,000,000 of the collateral mortgage Bethlehem bonds (being the entire issue); and that the plan as modified had thus become effective and binding.

The Wheeling & Lake Erie railroad is considering the advisability of rebuilding its shops, recently destroyed by fire, at Norwalk, O., instead of on the old site at Canton, O. The Canton board of trade will offer inducements to retain the shops in that city.

FAN POWER FOR THE CUPOLA.

BY THOS. D. WEST.

Recent experience in installing a large new fan and power to run it has impressed the writer with the importance of a more definite basis for purchasing the necessary power to run foundry fans. The fan, which, by the way, is a very good one, was purchased to blow a cupola 66 inches inside lining. The power required was given as 45 h. p., but in order to have a surplus we obtained a 75-h. p. motor. In starting to use the fan all connected to the cupola, we found it required 92 h. p. to give 1,735 revolutions, which was within 300 revolutions of what the fan should run to give its greatest volume of blast. Being afraid of burning out our motor, we at once wrote the fan people and had a man come to investigate the difficulty. He started in by stating that a fan required the greatest power when its gate was closed and criticised points in our piping which we were unable to have different at that time and of which not a word was written by the fan people when we were making inquiries of them as to the power required. We held the position that the motor power was entirely too light for the fan, no matter how the blast pipes were arranged, and asked him to take a test with the fan outlet free of all piping and wide open, as we did not agree with his claim that a closed outlet required the greatest power. This test, which we ran with 1,400 revolutions, took about 115 h. p.

The expert, thinking to evade the issue, offered to replace the 75-h. p. electric motor with a 50-h. p. steam engine and guarantee it to do the work, if we would furnish the steam; but knowing by the current record accurately what power we were using every minute (something we could not readily test ourselves with steam power), we of course ignored such a proposal.

Since there is now no accepted standard of power to run fans, I hold that the buyer or user should know the power required to run his fan when the outlet is open and closed. This is the greatest and least power that can ever be demanded, as can be seen by tests Nos. 9 and 10, Table I, and is the only intelligent basis upon which to compile tables.

When a fan or blower leaves the manufacturer's shops, it may go to a plant where conditions as to length and shape of piping, distance of cupola, character of tuyeres, difference in charging of iron and fuel, also their character, will vary greatly from the conditions at any place to which its duplicate may be shipped; and thus the exact power required will be different in every case. If one writes today for information on the efficiency of fans, he will likely receive tables showing that certain revolutions will give a certain volume and pressure, and these latter will bring down so much iron per hour, but not a line about the horse power required. Should results not tally with what the tables call for, when you get your fan at work, and you write a complaint, you may receive a confusing letter in support of the fan tables and claiming that you have something very unusual in your practice. Be this as it may, you are in trouble that could have been avoided had you the base for a standard herein suggested.

If we can know the maximum power that is likely ever to be used, as in the case of an accident rupturing the pipe adjoining the fan, and also know the least power required, as in the case where tuyeres are badly bunged up, or the fan wheels are cutting the air, as in test No. 10, Table I, we have two positive factors for a standard that can be definitely and satisfactorily used at the maker's and buyer's shops alike. And this without considering or including a lot of variables that cannot offer anything conclusive and only give cause for contention over conditions that are never alike in any two shops.

The power that is required in the everyday use of a fan or blower will vary greatly from that required to run them with open and closed outlets. Some fans can be found 100 to 200 feet away from their cupola, and as full of bends as a ram's horn, while others will be within a few feet of their cupola, with few if any bends in the piping. Of course, the shorter the piping and the fewer the bends the less power required to drive the fan or blower, and the better the service rendered. As an example, we reduced the load on our fan motor about 20 h. p. by moving our fan 15 feet nearer to our cupola and dispensing with two curved elbows as soon as conditions permitted the change. This is only one of the many conditions that vary and that call for a great difference in the actual power required between what a fan will need to run with open and closed outlet.

Some manufacturers of fans and blowers will no doubt object to stating the power necessary to run them open, on the ground that this calls for more power than will be used. This is true in most all cases, but it should not prevent them publishing such data at different speeds for a base to figure from.

As suggestions for rules to provide sufficient power for actual every day practice from the base of power required to run a fan open and closed, I would subtract the power required to run a fan closed from that required to run it open at any desired speed. For example, we present the following from tests No. 9 and 10, Table No. 1.

Maximum power with speed 1800 r. p. m. and open outlet	144.6 h. p.
Minimum power with speed 1800 r. p. m. and gate closed	37.2 "
Maximum power required in actual practice, speed 1800	107.4 "

A second rule would be to provide a power equal to 75 percent of the maximum load with open outlet at any desired speed as follows: $144.6 - 36.15 = 108.45$. One rule gives us 107.4 h. p., while the other gives 108.45 h. p., a difference of about one horse power. These are rules which could greatly improve present methods, and such as the buyer could test as well as the maker.

Users of all steam power connected with other machinery than their fan rarely know what power their fan is using. If the boiler or engine is found overloaded, the excess over calculations is generally charged to other tools, as the fan people had stated the exact power required. Of course there is a way to indicate the steam power used, but the inconvenience and often expense of such tests prevents many from having this done.

By the use of electricity one can readily detach machinery other than the fan to find at any moment just the power it requires. This modern method demands most exact knowledge of the actual power a fan requires. Had we shut our eyes to the amperes recorded, or placed full confidence in the instruction of our fan maker, we could have ruined an expensive motor in short order and shut down our works for many weeks to wait for a new motor, all at a cost of hundreds of dollars besides loss of customers.

The foundry business, by the aid of foundry literature, is coming more and more to scientific lines and we should possess a knowledge of the principles involved in the supplies we purchase, as well as of the manipulations on the floor and in the cupola.

TABLE NO. 1.

POWER AND PRESSURE TEST OF FAN BLAST, TAKEN JAN. 23, 1904.

No. of Test	Time	R. P. M.	H. P.	B. P.
1	8:00 a. m.	1800	120.5	5 oz.
2	10:00 "	1800	101.0	10 "
3	12:00 "	1800	76.7	11 "
4	1:00 p.m.	1800	75.4	12¾ "
5	2:00 "	1800	75.4	13 "
6	3:00 "	1800	70.8	12 "
7	4:00 "	1800	70.8	11⅝ "
8	5:00 "	1800	70.8	11¾ "
	5:30 "	Bottom dropped		
9	Open outlet	1800	14 .6	
10	Closed outlet	1800	37.2	15 "

Blast Pressure Gauges.

There are few things for use in a foundry that are more deceptive if not thoroughly understood, than blast pressure gauges. This is owing chiefly to the fact that any increase in the power to run a fan will not always produce like increase in blast pressure, as is seen by a study of Table No. 1. Here we find that with the exercise of the greatest power or blast volume, we have the lowest pressure and with the least power and creation of volume the highest pressure, thus giving us results in pressure the opposite of what we should expect, from the increase of power. In other words, pressure is often more due to resistance of delivery than to the power used to create the volume. This seeming inconsistency is

*Read before the Pittsburg Foundrymen's Association, March 7, 1904.

due to friction in the pipes and conditions of the stock in the cupola, especially that fronting the tuyeres. To demonstrate this was one reason for the tests shown in Table I. These it will be observed were obtained by maintaining a constant speed and making the power to run the fan the variable.

In using a blast pressure gauge, the pipe which first receives the impetus force of the moving blast should be placed at a point where the blast strikes with the most direct force, as at some turn, instead of the straight pipe where there is a more rapid moving action. A good plan is to insert a curved pipe in the main pipe, with its opening in a direct line with the main pipe or moving air, so as to have its force exerted squarely against the opening of the pipe which leads to the pressure gauge.

Test No. 1 was taken after the sand bottom was put in and with no fuel in the cupola, so as to leave free play for the blast through the cupola tuyeres. Here we have the freest liberation for volume of blast that is possible outside of disconnecting the pipes from the fan's outlet and blowing into the open air. In this test the fan requires 120.5 h. p. and we get but 5 ounces of pressure.

Test No. 2 was taken after the kindling and coke for the bed had been fired. We ran but a few minutes, for fear of blowing out the fire. Here, owing to the tuyeres being checked to a greater or less degree by coke, we find the pressure increased to 10 ounces.

Test No. 3 was taken about 5 minutes after starting the blast to melt down the iron, and gave a pressure of 11 ounces.

Tests No. 4 and 5 give us the highest pressure obtained during the heat and the only way we can explain the lower pressure further on is that after the fifth test the tuyeres must have burned out and become freer, or it may be that the iron was larger or not charged as close as when the men were fresh at the beginning of the heat. This irregularity in tuyere freedom appears in all long heats.

Test No. 9 was taken next morning by removing all piping from the fan outlet. Here we find 144.6 h. p. being required as against 37.2 when the gates were closed after connecting the pipes, a difference of 107.4 h. p. This shows the great difference required in power between forcing blast into the open air and against bunged tuyeres. Many have supposed that the more the tuyeres were bunged up the greater the power required to drive a fan. The reverse is the case. Test No. 10 is also interesting in showing the greatest blast pressure the fan is capable of producing—when it merely revolves to cut the air. The tests of Table 1 give much that should be of value to all interested in blast production.

It is not to be taken from what has been stated that we wish to advocate the abandoning of the blast pressure gauge. It is valuable as a comparative index of the pressure different fans and blowers can create under like conditions. It is also useful to indicate at the commencement of a heat if we are starting off with the pressure that experience with any particular fuel or conditions has proved best for use, and later, at any period of a test what volume of air is being delivered into a cupola, providing we use a speed indicator to observe the revolution of our motors or fans.

I wish to emphasize the importance of such a tool, as by its use we can tell better what volume the fan should deliver into our cupola providing there were no obstruction. What effect this obstruction has produced, as in the case of bunged tuyeres, we can fairly judge by the pressure gauge, and thus be better able to decide whether it is the want of blast or some other factor that prevents our obtaining the expected speed in melting.

The Question of Blast Volume.

It is said to require about 33,000 cubic feet of air to melt 2,000 pounds of iron in ordinary cupola practice. The more evenly this air is distributed throughout the fuel in a cupola the better economy and speed in melting. While combustion only demands volume of blast, we are compelled to utilize pressure in order to force the air into a cupola. It would be better if we could dispense with pressure entirely, but when we consider that the volume of air necessary to melt a ton of iron weighs about 2,851 pounds at 0° Fahr., which is much the temperature we have in winter, and about 2,419 pounds at 82° Fahr. in hot weather, we more fully realize the necessity of pressure to drive air into a cupola.

The greatest pressure a fan gives us is about one pound per square inch, whereas in blast furnaces we find 10 to 30 pounds pressure per square inch being used. When we consider that the bottom stock in a furnace which is so pliable or plastic through heat as to pack closely has a weight of 200 or more tons of stock—generally no coarser than coke, the ore often being as fine as molding sand—bearing down upon it, we can appreciate why a furnace requires such high pressure.

In a cupola we have pig iron and scrap to take the place of fine ore in a furnace and instead of stock ranging from 60 to 80 feet high, as in furnaces, we rarely exceed 10 feet, thus again showing us why there should be such a great difference in the pressure required between furnace and cupola practice.

We have stated that pressure could be dispensed with, and that it is volume that is really wanted; but as we cannot obtain the latter without utilizing the former we should look sharply to it that we get all of the pressure necesary to force the volume into our cupola and the more the air is driven to the center to give uniform distribution of blast the better. While our present makes of fans and blowers will give but about one pound pressure and then cut the air, we can by close charging, having large tuyere area, and keeping tuyeres open, greatly assist the blast to penetrate more to the center than is otherwise possible. With a small cupola this is not difficult, but with those above 60 inches inside diameter a "center blast tuyere" is very beneficial as we have found by using one for eight years past in our foundry.

This paper would be incomplete if we ignored the relation of blast to different densities of fuel. As a rule the more dense or solid the fuel the greater volume and pressure required. As an example, 48-hour or soft furnace coke is best blown with one-fourth to one-third less blast than 72-hour or a solid, hard foundry coke. The evils of blowing any fuel with a stronger blast than is required lie in a destruction of fuel, and lining, creation of foaming slag, and early bunging up of the tuyeres.

More depends on using the proper volume and force of blast to suit the different densities of fuel, in aiding successful melting, especially in long heats, than many realize. It is a feature of cupola practice that should be well studied until one finds what is best in his own particular cupola. Full knowledge on these points and watching them carefully at every heat will tend greatly to good melting and full clean bottom drops in cupola practice.

Julian Kennedy, Sahlin & Co., Ltd., the Pittsburg engineering concern, which opened offices in London last year, has recently taken a number of contracts for the remodeling on American lines of the blast furnace departments of some of the largest British iron and steel plants. The list comprises the Moss Bay Hematite Iron & Steel Co., Ltd ; Distington Hematite Iron Co., Ltd.; Millom & Askam Hematite Iron Co., Ltd.; Carnforth Hematite Iron Co., Ltd.; Bolckow, Vaughan & Co., Ltd.; Cargo Fleet Iron Co., Ltd.; Parkgate Iron & Steel Co., Ltd.; New Croansley Iron Co., Ltd.; Holwell Iron Co., Ltd.; W. Roberts, Ltd.; Tipton, Green Blast Furnaces; Ebbw Vale Steel, Iron & Coal Co., Ltd.; Guest, Keen & Nettlefolds, Ltd.; North Lonsdale Iron & Steel Co.; Baldwin's, Ltd.; Farnley Iron Co., and the Keltering Iron Co.

Patterson, Gottfried & Hunter, Ltd., 146-150 Centre street, New York, have recently concluded an arrangement with Brown & Wales, of Boston, Mass., by which that firm will act as the sole representatives in Boston of Patterson, Gottfried & Hunter, Ltd., and will carry there a large stock of Shaw patent compression couplings, Johnson safety shaft collars, B. & C. friction clutches, Robinson angle drives and National hangers.

The Davenport Locomotive Works, Davenport, Ia., have taken an order for four standard gauge switching engines to go to the Cerro de Pasco copper mines, Peru.

AMERICAN RADIATOR CO.'S REPORT.

The annual report of the American Radiator Co., just issued, shows a falling off in net profits as compared with the previous year of about $160,000. This reduction in profits, the report says, was due to obstacles which were the logical effect of the unprecedented and abnormal conditions that prevailed throughout 1902.

The figures compare as follows with previous years:

	1903.	1902.	1901.
Net profits	$540,517	$701,094	$627,614
Preferred stock dividends	210,000	210,000	210,000
Balance	$330,517	$491,094	$417,614

In 1900 the profits were $527,997, and in 1899 $657,161.

The balance sheet compares as follows:

ASSETS.

	1903.	1902.
Real estate, etc., Feb. 1	$7,353,963.00	$6,874,174.12
Additions during year	83,474.73	579,788.88
Total	$7,437,437.73	$7,453,963.00
Less depreciation	100,000.00	100,000.00
Net	$7,337,437.73	$7,353,963.00
Cash	$229,046.06	$216,791.73
Notes receivable	22,064.54	15,010.62
Accounts receivable	1,728,283.97	1,449,127.84
Raw material, supplies and finished products	949,190.72	1,055,253.75
Total quick assets	$2,928,585.29	$2,736,183.94
Total assets	$10,266,023.02	$10,090,146.94

LIABILITIES.

Capital stock, preferred	$3,000,000.00	$3,000,000.00
Capital stock, common	4,893,000.00	4,893,000.00
	$7,893,000.00	$7,893,000.00
Accounts and bills payable	316,136.62	470,778.17
Total	$8,209,136.62	$8,363,778.17
Balance	$2,056,886.40	$1,726,368.77
Total quick assets	$2,928,585.29	$2,736,183.94
Less all accounts and bills payable	316,136.62	470,778.17
Net quick assets	$2,612,448.67	$2,265,405.77

Commenting on the year's results, the report of President Woolley says, among other things:

"Our foreign business continues to grow steadily and satisfactorily, encouraged by the better facilities which have been supplied to secure same. Each year demonstrates larger advantages resulting from the varied locations of our plants and branches, and experience emphasizes the convenience and benefits accruing to our patrons, because of the opportunity which this affords to deliver the greater volume from many natural distributing centers, rather than from a few local points. We are, at present, equipped to deliver our products from twenty different warehouses, located in as many important points of distribution throughout this country. Still further progress has been made in the refinement of manufacturing processes, which enables us to advance in methods that offer economies, while steadily improving the quality of our wares. During the past year greater publicity has been given to our products through the advertising department, with satisfactory results from all parts of the country."

At the annual meeting of the stockholders J. B. Pierce, of Chicago, and Edward A. Summer and M. Clarence Carpenter, of Detroit, were re-elected directors.

President Felton of the Pennsylvania Steel Co., referring to recent reports that have been circulated, says that people do not reflect that in the recent contract made with the Canadian Pacific railroad for the sale of 40,000 tons of steel rails, the steel company receives a very considerable rebate, amounting probably to $1.50 per ton. He adds: "The papers are all wrong on the reports that we have given the Canadian Pacific Co. an option for 80,000 tons of rails additional at the 40,000 ton price. The order was only for 40,000 tons. No option has been given, and we expect no further business from that road in the early future."

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

Smith & Mabley, 513 Seventh avenue, New York, are purchasing equipment for their new automobile plant. The building, which is about completed, is 50 x 100 ft., seven and one-half stories high, and stands on a site at the foot of East Eighty-first street.

Machine tools are being purchased by the Canadian Pacific Railroad Co. through its Montreal offices for the shops in Winnipeg, Canada.

Frank Klapetho, 8 Bridge street, New York, consulting engineer for the Cerro De Pasco Mining Co., Cerro De Pasco, Peru, has sent out specifications for a 200-ton hydrostatic wheel press and a 66-inch wheel lathe.

A press for forming wheelbarrow bodies, a steam hammer and other machinery are required by the Scott Car Co., Knoxville, Tenn., which has recently completed the erection of a new machine shop 80 x 120 ft., with a boiler and engine room 40 x 60 ft. The company also has a woodworking shop, blacksmith shop and foundry.

A large amount of machinery will be required in the building of the $100,000,000 barge canal in New York State. State Engineer Bond will be chairman of the commission of five expert engineers who will supervise its construction. The other members will be Alfred Brooks Frye, now in charge of the United States buildings at the port of New York; Dr. Elmer L. Corthell, engineer of the West Short railroad; William A. Brackenridge, engineer in charge of the Niagara Falls Power Co.; and Major Thomas W. Symonds, United States engineer in charge of the public buildings at Washington.

The Betz Mfg. Co., of Hamilton, O., has been incorporated to manufacture metal specialties.

The Warp Twisting-In Machine Co. has been incorporated with a capital of $2,500,000, to manufacture textile machines and appliances. The principal office is located at Highlands, N. Y. The directors are: Benjamin Adriance, William C. Redfield, James H. William and Adrian D. Adriance, of Brooklyn; William E. Krey, of Richmond Hill, S. I.; Louis Ettlinger, of New York City; Anton Duppler, of Jersey City; Walter J. Green, of Utica; and Albert Goss, of Stamford, Conn.

The Blonder Bros. Mfg. Co., Chicago, has been incorporated with a capital of $24,000 to manufacture metal goods.

The Butman Engineering Co., Chicago, has been incorporated with a capital of $100,000. Incorporators are: Thomas R. Butman, Henry C. Wood and Edmund D. Adcock.

The American Ultimator Co., Buffalo, N. Y., has been incorporated with a capital of $50,000 to manufacture flour mill machinery.

The Fox Stove Co., Dayton, O., has been incorporated with a capital of $12,000. Incorporators are: H. W. Rixley, J. W. Eberle, E. F. Abernethy, C. F. Brice and George W. Ozias. The company succeeds Chas. F. Fox.

The Champion Shear Co., Bridgeport, Conn., has been incorporated with a capital of $12,000 to manufacture shears and other implements.

The Morrison Iron Co., Norwalk, O., has been incorporated with a capital of $10,000. Incorporators are: Ode N. Navarre, Adrian F. Hermingsen, Max and Nathan Schreiber, and George Herskovits.

The Clark-Wells Machinery Co., Detroit, Mich., has been incorporated with a capital of $15,000.

The Charlton Wire Co., Charlton, Mass., has been incorporated with a capital of $15,000; president, George C. Goodwin; treasurer, Justin W. Crosby.

The Buffalo Motor Car Co., Buffalo, N. Y., has been incorporated with a capital of $10,000 to manufacture and sell motors and engines. The directors are: Frank J. Alligen, Tonawanda; Fred Wende, Buffalo; William A. Lautz, Buffalo.

The Penn Shovel Co., with a capital of $100,000, has been incorporated to carry on the business of that company, which will move its plant from Corry, Pa., to Warren, O. Incorporators are: Dan A. Geiger, J. A. Fuller, W. T. Gris-

wold, Jules Vantrot Jr., and S. W. Park. The company is already loading its machinery for shipment to Warren. It has been in business about three years and in the beginning turned out only a few dozen shovels per day, but its product has recently been 6,000 dozen shovels per month. It has a large export trade.

The Gas Appliance Mfg. Co. has been organized at Grand Rapids, Mich., with a capital of $10,000. The company will manufacture gas regulators, burners, heaters, furnaces and gas appliances. The principal stockholders are George T. Gamble and James Paul Ray.

Durham Iron Works Co., Durham, N. C., wants machine tools and supplies for foundry and machine shop.

C. W. Sullivan, Ruby, S. C., wants iron lathe, with or without tools, second-hand; also a small gasoline engine.

Lockridge Oil Co., care of J. W. Lockridge, Hurnville, Texas., wants price on gasoline engine.

D. O. Sullivan, Richmond, Va., is in the market for engine and boiler of 20 h. p. capacity.

Anderson & Moser, Tampa, Fla., want to correspond with manufacturers relative to prices on galvanized ridge roll suitable for laying over hips.

Williams & Seyforth Co., 46 Monroe street, Memphis, Tenn., wants prices on gas an gasoline engines.

C. H. Newman, Blackstone, Va., wants 7 or 10-h. p. steam engine and 4 or 5-h. p. gasoline engine.

Anthracite Machinery Co., Allentown, Pa., wants to buy second-hand two 40 to 50-h. p. Corliss engines; hoisting engines, 25 to 50-h. p.; pumps, cable, rails, pipe, etc.

The Springfield Furnace Co., Springfield, O., has been incorporated with a capital of $10,000. Incorporators are: Thomas Bentham, A. L. Beanpain, J. A. Humphreys, C. M. Bennett and Almo G. Herbert.

The Empire State Novelty Co. has been organized at Little Falls, New York, with a capital of $25,000 to manufacture iron and steel novelties, such as small carts, go-carts, toy automobiles, etc.

The Troy Scrap Iron & Metal Co., Troy, N. Y., has been incorporated with a capital of $25,000. The directors are: A. L. Harper, P. A. Gillespie and M. T. Gillespie, Troy.

The Western Steel Gate Co., Two Rivers, Wis., has been incorporated with a capital of $20,000 to manufacture gates and farm implements.

The L. B. Waugh Co., Minneapolis, recently incorporated with a capital of $100,000, for the purpose of manufacturing fire and burglar proof safes, vault fronts and linings, etc., is now in the market for the various kinds of machinery used in the manufacture of safes. The company expects to have its plant running inside of ninety days.

The Wabash R. R. Co. expects to install a large power bending roll in its boiler shop at Moberly, Mo.; also a 42-inch lathe, and a vertical drilling machine with a capacity for 60-inch work. About $15,000 will cover the amount to be expended in this new machinery. The company is building at Vandeventer avenue, St. Louis, a passenger engine roundhouse which will be modern in every respect, equipped with Sturtevant heaters and ventilators; 70-foot steel turntable, equipped with a gasoline motor with which it will be operated. As yet the company has not decided what machinery will be installed at that point. G. W. Mudd, Moberly, Mo., is master mechanic.

New Construction:—

Fairbanks Machine Tool Co., Springfield, O., manufacturer of piano plates, will build an addition to its plant.

Stevens & Blume, Detroit, Mich., have let contracts for a machine shop to be erected by Henry Van Middleditch. The building will be 50 x 100 feet, two stories and basement, of steel and heavy mill construction, with stone trimmings and composite roof.

The Art Chandelier & Brass Works, Richmond, Ind., will build a new plant. The site has not yet been selected.

The new plant which is being erected by the Pickering Governor Co., Portland, Conn., is nearing completion and it is expected that it will be equipped and occupied within two months. The plant has a frontage of 220 feet and is considerably more commodious than the present quarters of the company. Part of the plant is three stories high, part two stories and the machine shop and foundry one story.

A. P. Gilbert will establish a foundry and machine plant at Durham, N. C., organizing the Durham Iron Works Co., with a paid in capital of $11,000. The main building will be 50 x 100 feet; dimensions of others not yet determined.

The Selma Stove Works, recently organized at Selma, Ala., with a capital of $20,000, is arranging for the erection of a foundry.

The Lake Shore railroad is preparing to build two roundhouses and a machine shop at Elkhart, Ind. Work will begin as soon as the frost is out of the ground.

Wm. T. Taylor, of Oklahoma City, has purchased the Wayland machine shops at Ardmore, I. T. Mr. Taylor will add an iron foundry to the plant.

The Angola Engine & Foundry Co., Angola, Ind., recently increased its capital stock from $20,000 to $50,000. It will build an addition to its plant.

The Big Four railroad has authorized the expediture of $150,000 in improving its shops at Mattoon, Ill. A 40-ton crane and a 15-ton traveling crane will be installed and considerable other new machinery will be purchased.

The Harrison Machine Works, Belleville, Ill., which recently sold the site on which for many years was located its machine shop, will remain in Belleville and will ercet a new structure in which agricultural implements will be manufactured. Lee Harrison, one of the members of the firm, is now visiting large agricultural plants preparatory to completing plans for a new plant.

The F. W. Spacke Machine Co., Indianapolis, Ind., has purchased a site with a frontage of 150 ft. and will ercet a new plant.

Fires and Accidents:—

Fire destroyed the roof of the foundry of the American Bed Co., St. Louis a few days ago. A large number of valuable metal flasks were damaged. Loss $4,000, fully insured.

Fire, on the night of Feb. 27, in the plant of the National Brass & Iron Works, Reading, Pa., resulted in a part of the property being destroyed. The loss was $100,000, covered by insurance.

Fire in the plant of the Valley Iron Co., Bay City, Mich., a few days ago caused damage amounting to about $3,000, covered by insurance.

The Pittsburg and Valley Districts:—

The men employed on the 119-inch plate mill of the Homestead plant of the Carnegie Steel Co., Homestead, Pa., have taken positions on the new 140-inch mill and the former is to be dismantled to make room for additional open-hearth capacity. The 119-inch mill is now idle but the work of dismantling it has not yet been commenced.

The receivers of the Clairton Steel Co. have issued orders to prepare stack No. 1 of the Clairton plant at Clairton, Pa., for resumption at an early date. This stack has been idle for some time, furnace No. 2 alone being in operation at the present time. No work is being done on furnace No. 3 and it is not known when this furnace will be completed.

The Haselton stack of the Republic Iron & Steel Co., near Youngstown, O., will resume operations in a few days. It has been idle for nearly six months.

The plant of the American Spiral Spring & Mfg. Co., Pittsburg, was destroyed by fire last week; loss, $10,000.

The Oliver & Snyder Steel Co., Pittsburg, has its Oliver plant No. 3 now in full operation. This plant consists of 300 ovens and the last of these ovens was only completed a short time ago. This company has 1,108 ovens at its three plants and is shipping both foundry and furnace coke.

Creditors of the Reese-Hammond interests of Bolivar, Pa., which recently passed into the hands of a receiver, will attempt to reorganize the different concerns. The companies which acknowledge their insolvency are the Reese-Hammond Fire-Brick Co., United States Enameled Fire Brick Co., Hammond, Berkey & Co., the Curwensville Fire Brick Co. and the Pennsylvania & Kentucky Fire Brick Co., of Kentucky. The total gross assets are given as $1,339,459.67 and the liabilities, $789,201.54. The reorganization movement is in the hands

of a committee headed by James S. Beacom, of Greensburg, Pa., and it is the intention to form the Reese-Hammond Fire Brick Co., Inc., with bonds amounting to $900,000 which will be taken by the creditors.

General Industrial Notes:—

Frederick H. Wakeman has purchased the business and plant of the Standard Machinery Co., Chattanooga, Tenn. He will continue the operation of the plant and will probably make improvements and enlargements.

The American Bridge Co. is figuring on a Mexican bridge contract which will be awarded soon, and which is said to be the largest of its kind ever let in the Southern republic.

The Seneca Chain Co., Kent, O., is about to be consolidated with the Peterson Mfg. Co., of that town. The merged industries will be reincorporated and will be known as the Seneca Chain Mfg. Co., for the manufacture of chains and land rollers. Capital $100,000.

The rail department of the Illinois Steel Co.'s plant at South Chicago has been closed indefinitely on account of a lack of orders. About 800 men were employed in the mill. The open hearth and plate mills have also been closed.

The plant of the Republic Iron & Steel Co., of Alexandria, Ind., has been closed. The mill, when at normal capacity, employed 450 men, but has been working irregularly for a year or more. Much difficulty was experienced in obtaining a supply of fuel.

Daniel Dow, proprietor of the Grand Forks Foundry & Machine Shop, Grand Forks, N. D., has decided to establish a branch in Winnipeg, Manitoba. A building has been rented and the plant will soon be in operation.

Emerick Bros., who have been operating a foundry at Blue Hill, Neb., have decided to move their plant to Hastings, Neb. A building has been rented.

The Kelly Nail & Iron Co., Ironton, O., has nearly completed arrangements for the installation of a barbed wire department in its plant. All the machinery has been ordered.

Oscar Weinborg is president and manager and Charles B. Anderson is secretary and treasurer of a company organized at Batavia, Ill. by men formerly employed by other companies. Its business will be repairing engines and machinery.

The Brazilian order for 7,000 tons of steel rails, recently on the market, has been secured by a Belgian concern—the Angleur Steel Works.

The Nebraska board of public lands and buildings has decided to ask for bids for 84 additional cells for the State penitentiary. The Van Dorn Iron Works, Cleveland, O., recently received a contract for 156 cells at $69,030, but the auditor of state has refused to pay the bill, on the ground that the appropriation of $80,000 for 240 cells would not allow the State to pay more than $333 1-3 for each cell. It is expected that the Cleveland company will bid on the additional cells at such an amount that the total cost will not exceed $80,000.

The old Janes & Kirtland foundry, New York City, recently sold, will be torn down very soon. It will not again be used as a foundry.

The Bessemer Soil Pipe Co., Bessemer, Ala., recently made a shipment of soil pipe to China.

The Peacock Iron Works, Selma, Ala., have received a contract from the Seaboard railway, of Alabama, a narrow gauge road 60 miles long in the southern part of the State, to change all of the rolling stock of the company from its present narrow gauge to the standard gauge. All of the engines are also to be overhauled. Several months will be required to complete the contract.

The stockholders of the United States Heater Co., Detroit, at their annual meeting, re-elected the old board. A report was submitted showing that the manufacture of radiators undertaken last year was an unqualified success. A dividend of 8 percent was declared and a satisfactory sum was added to the surplus.

The recent increase of capital stock of the Mayer Furnace Co., Peoria, Ill., was deceided upon in order to carry on the rapidly increasing volume of business. The company has recently put in a line of compression riveters and air tools, and has just placed an order for a 100-ton hydraulic flanging press. It will soon be in position to figure on flanging for other manufacturers. The plant was destroyed by fire last year and has recently been rebuilt.

The open hearth furnaces of the Colorado Fuel & Iron Co. have resumed operation. Superintendent Means, of the blast furnace department, has had a large force of men at work getting the furnaces in shape for operation. Two of the furnaces are now ready to be blown in.

The plant of the Southern Car & Foundry Co., Gadsden, Ala., has been closed on account of scarcity of orders.

The Chicago, Rock Island & Pacific Railroad Co. has made a contract with the Berry Foundry & Mfg. Co., of St. Joseph, Mo., for all the castings needed for the system west of the Missouri river.

Industrial conditions at Paterson, N. J., have recently improved very much. Work has been started at the Rogers Locomotive Works on 50 new locomotives for the Erie railroad. At the Paterson plant of the American Locomotive Co. 500 engines of the Erie railroad are to be repaired.

The Simonetta File Co., of Detroit, recently organized with a capital stock of $25,000, has elected the following officers and directors: Rodolfa Simonetta, president and general manager; Charles H. Berry, vice president; Eugene C. Whitney, secretary and treasurer; Henry J. Boerth, D. Z. Curtiss. The company will engage in the manufacturing of files, rasps, and the tempering of tools. Only the best English steel will be used and the tempering done by the Simonetta secret process, which has been used by the Simonetta family in Italy since 1849. The plant is located at 192, 194, 196 High street west, and will be in operation March 15.

The Empire Foundry Co., New Brunswick, N. J., is doing a very satisfactory business in spite of dull times in many plants. It has a well equipped foundry plant employing about 100 molders and has the reputation of making a very fine grade of light gray iron castings.

The Baldt Steel Co., manufacturer of steel castings, will begin operations at its new plant at Newcastle, Del., May 1.

The Cheraw Foundry & Machine Co., Cheraw, S. C., now has its new foundry in full operation. Considerable new machinery has been installed in the shops.

The American Car & Foundry Co. has given employment to 200 men in its plant at Detroit, who had been laid off since the beginning of the year.

The steel department of the Wheeling Steel & Iron Works, at Benwood, has been closed down for an indefinite period.

The Dillon-Griswold Wire Co., Sterling, Ill., made a shipment March 1 of Griswold wire fence to Europe.

The Niles-Bement-Pond Co. has secured a contract for electric traveling crane equipment for installation in the machine shops of the electric traction system, which is now under construction in Manila, by the Manila Electric Railways Corporation, of which Charles Swift, of Detroit, is president. It is expected that the road will be in operation in about nine months.

Out of a force of 2,200 men formerly employed in the mills and office of the Tidewater Steel Works, Chester, Pa., there remain but two, President Stafford and Secretary Johnson. The mill workers were dismissed some weeks ago, but the office force was retained until last week.

The Eastman Kodak Co., of Rochester, N. Y., manufacturer of cameras, has purchased two 16 x 28 x 18 vertical cross compound engines of the Ball Engine Co., Erie, Pa.

The Elwell-Parker Electric Co., Cleveland, finds prospects not unpromising. It has recently contracted for a large batch of automobile motors, also a number of special and standard crane motors, and also for a half dozen of its 200-h. p. special, heavy duty hoisting motors. While business is not exactly rushing, the company regards the outlook for the year as being fairly satisfactory. In addition to the above, it has secured the usual amount of miscellaneous small business.

The New Britain Machine Co., New Britain, Conn., has secured a contract for a large chain saw mortising machine, which is to be used for cutting fence posts for guarding right of way on the London & Northwestern railroad, London.

A COCHRANE HEATER

MEANS MONEY SAVED

If your engines exhaust free to the atmosphere, and you are feeding your boilers with live steam injectors or with water at less than 200° F., then any exhaust steam escaping means the waste of a lot of money that you might as well pocket instead of handing it over to the coal man. It will amount to from 5 to 15 per cent of the entire fuel bill as a rule, and if you think this item is worth saving, you are sure to be interested in our Cochrane Feed Water Heaters.

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J. K. Dimmick & Co., Drexel Building	Philadelphia, Pa.
J. K. Dimmick & Co., Murtland Building	Pittsburg, Pa.
J. K. Dimmick & Co., Ellicott Square	Buffalo, N. Y.
Robert Field, 1105 Traction Building	Cincinnati, O.
William Wieman, 605 Citizens Bank Building	Cleveland, O.
E. C. Smith, 508 Commonwealth Trust Building	St. Louis, Mo.
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The Buyers' Directory in the back part of this issue is for the benefit of our readers, and should be used by them. It thoroughly covers the lines manufactured by our customers.